

PRIMERGY BX900 / BX400 InfiniBand Modules (56Gb)

Connection Blade and Mezzanine Card V4.0
(Linux®, Windows®)

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Certified documentation according to DIN EN ISO 9001:2008

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2008.

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1 Introduction

This manual describes the configuration, installation and basic use of the InfiniBand connection blade and Mezzanine card software. The package includes tools for general and advanced management functionality.




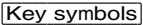


It also describes the installation of OFED (OpenFabrics Enterprise Distribution) for Linux, the identification of the Mezzanine card and Win OpenFabrics installation for Windows.

The hardware installation of the InfiniBand connection blade is described in the BX900 S2 or BX400 S1 System Unit Operation manual.

The hardware installation of the Mezzanine card is described in the Upgrade and Maintenance Manual of the BX92x S3 server blades.

1.1 Notational Conventions

The following notational conventions are used in this manual:

	Caution	This symbol points out hazards that can lead to personal injury, loss of data, or damage to equipment.
		This symbol highlights important information and tips.
		This symbol refers to a step that you must carry out in order to continue with the procedure.
<i>italic</i>		Commands, menu items, names of buttons, options, file names, and path names are written in <i>italic</i> letters in the text.
<variable>		Marked variables that must be replaced by current values.
fixed font		System output is written using a fixed font.
semi-bold fixed font		Commands to be entered through the keyboard are written in a semi-bold fixed font.
		Keys are presented according to their representation on the keyboard. If capital letters are to be entered explicitly, then the Shift key is shown, e.g.  -  for A. If two keys need to be pressed at the same time, then this is indicated by placing a hyphen between the two key symbols.

Fujitsu Support

Please contact your Fujitsu Technical Support if you require assistance:

<http://support.ts.fujitsu.com/com/support/index.html>

If you purchased the products from Fujitsu Japan, please consult your system engineer.

1.2 Target Group

This manual is intended for users, developers, and system administrators responsible for setting up and maintaining switch system platforms using InfiniBand fabrics and networks. The switch system platforms must have a management server or client, in order for the package to work.

The manual assumes familiarity with the InfiniBand® Architecture Specification as well as Ethernet Architecture Specification.

1.3 Documentation Overview



PRIMERGY manuals are available in PDF format on the ServerView Suite DVD 2. The ServerView Suite DVD 2 is part of the ServerView Suite supplied with every server.

If you no longer have the ServerView Suite DVDs, you can obtain the relevant current version using the order number U15000-C289 (the order number for Fujitsu Japan: please refer to the configurator of the server <http://jp.fujitsu.com/platform/server/primergy/system/>).

The PDF files of the manuals can also be downloaded free of charge from the internet. The overview page showing the online documentation available on the internet can be found using the URL (for EMEA market): <http://manuals.ts.fujitsu.com>. The PRIMERGY server documentation can be accessed using the *Industry standard servers* navigation option.

If you purchased the products from Fujitsu Japan, please use the URL: <http://jp.fujitsu.com/platform/server/primergy/manual/>.

1.4 Overview

This manual explains the use of the software management. Managed devices must have a CPU and a management board. This board has an operating system and a toolset to operate, manage, and upgrade the device.

Further information is provided on the PRIMERGY ServerBooks DVD:

- PRIMERGY BX900 S2 Blade Server System – Operating Manual
- PRIMERGY BX400 S1 Blade Server System – Operating Manual
- PRIMERGY Server Systems – RemoteDeploy
- PRIMERGY BX Blade Server Systems – LAN Connection Blade
- ServerView User Guide



For further information on updating BX components please refer to the Operating Manual of your BX system.

1.5 PRIMERGY BX900

The PRIMERGY BX900 Blade Server system is a modular server system that integrates up to 18 server modules, eight connection blade modules and two Management Modules (MMB).

The InfiniBand connection blade module provides networking and Switch functions to PRIMERGY BX900 Blade Server system. The Management Module offers a single point of control for the PRIMERGY BX900 Blade Server system.

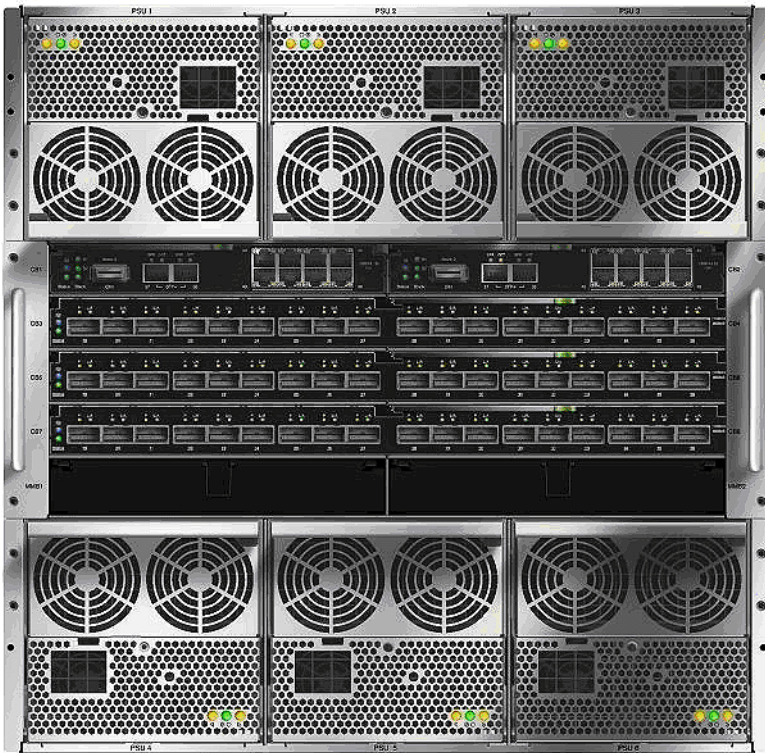


Figure 1: PRIMERGY BX900 Blade Server

1.6 Inserting Connection Blade into PRIMERGY BX900

In order to support 4x FDR InfiniBand, 4 lanes per one port are required in backplane. Due to this reason, the form factor of connection blade is double wide - single height.

The eject lever of the connection blade has a green touch button. The places at which all components may be touched to prevent them from being damaged when they are assembled or disassembled are also marked green.

Rear view of enclosure		
Fabric 1	CB1	CB2
Fabric 2	CB3	CB4
Fabric 3	CB5	CB6
Fabric 4	CB7	CB8

Figure 2: Rear view of enclosure

1.7 Connecting Mezzanine Cards on Server Blade

The figure below indicates the connection relation between connection blade (CB) and Mezzanine Card on server blade. InfiniBand (IB) Mezzanine Cards can be set to both Mezzanine I slot and Mezzanine II slot. When Mezzanine Card is installed in Mezzanine II slot, the dual port of the card will be available and one of two ports will be connected to CB in CB5/6, the other one will be CB7/8. While installed in Mezzanine slot I, only one port will be utilized and connected to the CB in CB3/4. When the two connection blades are installed in CB5/6 and CB 7/8, other types of connection blades like SB11/SB11A can be used in CB1/2/3/4 and, SBAX2 and Brocade FC connection blade in CB3/4 in parallel with IB connection blade.

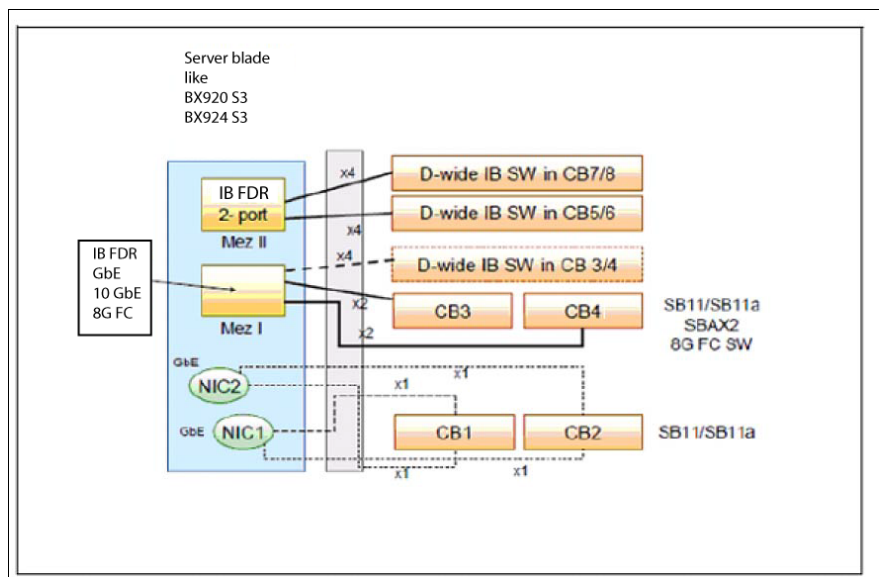


Figure 3: Connection relation between server blade and connection blade

1.8 Description of InfiniBand Connection Blade

The PRIMERGY BX900 InfiniBand connection blade module features 18 internal and 18 external 4x14Gbps (FDR) ports. The below figure shows the front view with the 18 external ports, whereas the internal ones are connected to the server blades over Midplane.



Figure 4: InfiniBand connection blade

1.8.1 Cables

For best performance use the InfiniBand connection blade with QSFP (Quad Small Form factor Pluggable) connectors. Copper and optical variants can be used.

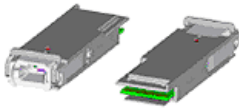


Figure 5: QSFP connectors

1.8.2 LEDs

Connection Blade LEDs

To indicate overall status of the connection blade, two LEDs are located at the left side of the front panel.



Figure 6: LED-ID/Status

LED	Position	Color	Function
ID (Identify LED)	Left side: top	Blue	Identify active
		Off	Identify inactive
Status (Health LED)	Left side: bottom	Green	Power on
		Amber blinking	Error
		Off	Power off

Table 1: Connection blade LEDs

Port LEDs

For every external port a pair of LEDs exists.



Figure 7: Port-Leds

LED	Position	Color	Function
P (Port Physical Link)	Above port: right	Green	Link up
		Off	No Link
L/A (Port Logical Link)	Above port: left	Yellow	Link up
		Yellow blinking	Link active
		Off	Link down

Table 2: Port LEDs

1.9 Technical Data

1.9.1 IB Connection Blade

Internal Ports:	18
External Ports:	18
Lanes per Port:	4 (4x)
Max Speed per Lane:	14Gbps (FDR)
Product Weight:	9.4 Lbs / 4.3 kg
Form Factor:	Double wide
Height:	27.9 mm / 1.1"
Width:	388.2 mm / 15.3"
Depth:	267.9 mm / 10.6"

1.9.2 IB Mezzanine Card

Form factor:	BX900 Standard form factor
Server blades supported:	BX920 S3 BX924 S3
Max. number of Mezzanine Cards per blade:	2
Host interface:	x8 PCI-Express Gen3
Interface to midplane:	2 * 4x14Gbps (FDR)

(Consider restrictions mentioned in [section “Inserting Connection Blade into PRIMERGY BX900” on page 9](#) and [section “Connecting Mezzanine Cards on Server Blade” on page 10](#)).

2 Linux Installation

2.1 Overview

This chapter describes how to install a single host machine with Fujitsu InfiniBand hardware installed. A blade can be properly installed with all required InfiniBand drivers and software during Red Hat Enterprise Linux installation.

If you purchased the products from Fujitsu Japan, you can download it from <http://jp.fujitsu.com/platform/server/primergy/downloads/>.



Please note, that only **Red Hat Enterprise Linux Version 5.7 or higher, and 6.1 or higher** are supported!

The chapter includes the following sections:

- “Software Requirements” on page 15
- “OFED Installation” on page 16
- “Updating Firmware after Installation” on page 27
- “Subnet Manager” on page 27
- “Network Configuration Information” on page 29

2.2 Software Requirements

Required Disk Space for Linux Installation

400 MB

Operating System

Linux operating system (x86_64 only)

Installer Privileges

The installation requires administrator privileges on the target machine.

2.3 OFED Installation

Please install OFED by the following steps after the OS installation by SVIM (Server Installation Manager).

- ▶ Download OFED from Fujitsu Technology Solutions Web site (<http://support.ts.fujitsu.com/com/support/downloads.html> > Driver & Downloads)
- ▶ If you purchased the products from Fujitsu Japan, you download it from <http://jp.fujitsu.com/platform/server/primergy/downloads/>.



Warning

This software is the driver package of ConnectX-3 IB Mezzanine card (56Gbps).

This package driver does not supported ConnectX-2 IB Mezzanine card (40Gbps).

2.3.1 OFED installation on RHEL5.8

1. Mount *iso* file and move to */mnt*.

In the following example, the OFED is *MLNX_OFED_LINUX-1.5.3-3.0.0-rhel5.8-x86_64.iso*

```
[root@localhost ~]# mount -ro loop MLNX_OFED_LINUX-1.5.3-3.0.0-rhel5.8-x86_64.iso /mnt
[root@localhost ~]# cd /mnt/
[root@localhost mnt]#
```

2. Execute Installer and enter *y*

```
[root@localhost ~]# ./mlnxofedinstall --without-32bit
--without-fw-update
This program will install the MLNX_OFED_LINUX package on
your machine.
Note that all other Mellanox, OEM, OFED, or Distribution IB
packages will be removed.
Do you want to continue?[y/N]:y
```

3. The following messages are displayed. Add an option (*--nodeps*) and uninstall the package.

Please remove OFED RPMs coming from the Distribution.

Run:

```
rpm -e --allmatches openmpi libcxgb4 ofed-docs-1.4.1-2.el5
openib-1.4.1-6.el5 libibverbs libibverbs-utils libmthca
libmlx4 libcxgb3 libnes libipathverbs libibcm libibumad
libibmad librdmacm librdmacm-utils libsdp opensm-libs
compat-dapl compat-dapl-devel dapl dapl-devel dapl-utils
perftest rds-tools ibutils infiniband-diags qperf
libibverbs libibverbs-utils libmthca libmlx4 libcxgb3
libnes libipathverbs libibcm libibumad libibmad librdmacm
librdmacm-utils libsdp opensm-libs compat-dapl compat-dapl-
devel compat-dapl-utils dapl dapl-devel dapl-utils perftest
rds-tools infiniband-diags qperf ofed-docs openib opensm-
libs openmpi openmpi-libs ibutils ibutils-libs mpitests-
openmpi ofed-docs-1.4.1-2.el5
```

Some RPMs may depend on the RPMs above. Please uninstall them manually.

Uninstall the Packages.

```
[root@localhost mnt]# rpm -e --nodeps --allmatches openmpi
libcxgb4 ofed-docs-1.4.1-2.el5 openib-1.4.1-6.el5
libibverbs libibverbs-utils libmthca libmlx4 libcxgb3
libnes libipathverbs libibcm libibumad libibmad librdmacm
librdmacm-utils libsdp opensm-libs compat-dapl compat-dapl-
devel dapl dapl-devel dapl-utils perftest rds-tools ibutils
infiniband-diags qperf libibverbs libibverbs-utils libmthca
libmlx4 libcxgb3 libnes libipathverbs libibcm libibumad
libibmad librdmacm librdmacm-utils libsdp opensm-libs
compat-dapl compat-dapl-devel compat-dapl-utils dapl dapl-
devel dapl-utils perftest rds-tools infiniband-diags qperf
ofed-docs openib opensm-libs openmpi openmpi-libs ibutils
ibutils-libs mpitests-openmpi ofed-docs-1.4.1-2.el5
```

4. Execute Installer again and enter *y*.

```
[root@localhost mnt]# ./mlnxofedinstall --without-32bit
--without-fw-update
This program will install the MLNX_OFED_LINUX package on
your machine.
Note that all other Mellanox, OEM, OFED, or Distribution IB
packages will be removed.
Do you want to continue?[y/N]:y
Starting MLNX_OFED_LINUX-1.5.3-3.0.0 installation ...
Installing mlnx-ofa_kernel RPM
Preparing...#####
mlnx-ofa_kernel #####
Installing kmod-mlnx-ofa_kernel RPM 3
:
:

Installation finished successfully.
Configuring /etc/security/limits.conf.
Please reboot your system for the changes to take effect.
[root@localhost mnt]#
```

5. Unmount */mnt* directory

```
[root@localhost mnt]# cd /
[root@localhost /]# umount /mnt/
[root@localhost /]#
```

6. Restart the OS

```
[root@localhost /]# reboot
```

7. Check the modification of *limits.conf* file.

```
[root@localhost /]# tail -2 /etc/security/limits.conf
* soft memlock unlimited
* hard memlock unlimited
[root@localhost /]#
```

Please re-install from step3 when the 2 messages above were not displayed.

2.3.2 OFED installation on RHEL6.2

1. Mount *iso* file and move to */mnt*.

```
[root@localhost /]# mount -ro loop MLNX_OFED_LINUX-1.5.3-3.0.0-rhel6.2-x86_64.iso /mnt/
[root@localhost /]#
[root@localhost /]#cd /mnt/
```

2. Execute Installer and enter *y*

```
[root@localhost mnt]# ./mlnxofedinstall --without-32bit
--without-fw-update
This program will install the MLNX_OFED_LINUX package on
your machine.
Note that all other Mellanox, OEM, OFED, or Distribution IB
packages will be removed.
Do you want to continue?[y/N]:y
```

3. The following messages are displayed. Add an option (*--nodeps*). Delete *scsi-target-utils* from the package currently displayed, and uninstall a package.

Please remove OFED RPMs coming from the Distribution.

Run:

```
rpm -e --allmatches rdma rdma-1.0-14.el6.noarch libibverbs
libibverbs-utils libmthca libmlx4 libcxgb3 libnes
libipathverbs libibcm libibumad libibmad ibsim librdmacm
librdmacm-utils opensm-libs dapl rds-tools ibutils
infinipath-psm libibverbs libibverbs-utils libmthca libmlx4
libcxgb3 libnes libipathverbs libibcm libibumad libibmad
ibsim librdmacm librdmacm-utils opensm-libs compat-opensm-
libs dapl rds-tools infinipath-psm opensm-libs
libipathverbs dapl libibcm libibmad libibumad ibsim ibutils
ibutils-libs fcoe-utils scsi-target-utils compat-openmpi
compat-openmpi-psm fcoe-utils scsi-target-utils
```

Some RPMs may depend on the RPMs above. Please uninstall them manually.

Uninstall the packages.

```
[root@localhost mnt]#
[root@localhost mnt]# rpm -e --nodeps --allmatches rdma
rdma-1.0-14.el6.noarch libibverbs libibverbs-utils libmthca
libmlx4 libcxgb3 libnes libipathverbs libibcm libibumad
libibmad ibsim librdmacm librdmacm-utils opensm-libs dapl
rds-tools ibutils infinipath-psm libibverbs libibverbs-
utils libmthca libmlx4 libcxgb3 libnes libipathverbs
libibcm libibumad libibmad ibsim librdmacm librdmacm-utils
opensm-libs compat-opensm-libs dapl rds-tools infinipath-
psm opensm-libs libipathverbs dapl libibcm libibmad
libibumad ibsim ibutils ibutils-libs fcoe-utils compat-
openmpi compat-openmpi-psm fcoe-utils
```

4. Execute Installer again and enter y

```
[root@localhost mnt]# ./mlnxofedinstall --without-32bit
--without-fw-update
This program will install the MLNX_OFED_LINUX package on
your machine.
Note that all other Mellanox, OEM, OFED, or Distribution IB
packages will be removed.
Do you want to continue?[y/N]:y
```

Starting MLNX_OFED_LINUX-1.5.3-3.0.0 installation ...

```
Installing mlnx-ofa_kernel RPM
Preparing... #####
mlnx-ofa_kernel #####
Installing kmod-mlnx-ofa_kernel RPM
:
:
Installation finished successfully.
Configuring /etc/security/limits.conf.
Please reboot your system for the changes to take effect.
Following RPMs, coming with the Linux Distribution, were
removed due to dependencies,
please reinstall them if required: scsi-target-utils
[root@localhost mnt]#
```

5. Unmount */mnt* directory.

```
[root@localhost mnt]# cd /  
[root@localhost /]# umount /mnt  
[root@localhost /]#
```

6. Restart the OS.

```
[root@localhost /]# reboot
```

7. Check the modification of *limits.conf* file.

```
[root@localhost /]# tail -2 /etc/security/limits.conf  
* soft memlock unlimited  
* hard memlock unlimited  
[root@localhost /]#
```

Please re-install from step3 when the 2 messages above were not displayed.

2.3.3 Update of OFED

This chapter describes the updating of OFED.

Only with RHEL5.7 or RHEL6.1, OFED may be updated by the following steps:

- ▶ Download OFED from Fujitsu Technology Solutions Web site (<http://support.ts.fujitsu.com/com/support/downloads.html> > Driver & Downloads)
- ▶ If you purchased the products from Fujitsu Japan, you download it from <http://jp.fujitsu.com/platform/server/primergy/downloads/>.

2.3.3.1 Updating of OFED on RHEL5.7

1. Mount *iso* file and move to */mnt*.

In the following example, the OFED is *MLNX_OFED_LINUX-1.5.3-1.0.0.2-rhel5.7-x86_64.iso*

```
[root@localhost ~]# mount -o ro,loop MLNX_OFED_LINUX-1.5.3-1.0.0.2-rhel5.7-x86_64.iso /mnt  
[root@localhost ~]# cd /mnt/  
[root@localhost mnt]#
```

2. Force *libibverbs* and *libibverbs-devel* packages to be uninstalled.

```
[root@ localhost mnt]# rpm -e --nodeps --allmatches libibverbs-
devel
[root@ localhost mnt]# rpm -e --nodeps --allmatches libibverbs
[root@ localhost mnt]#
```



If these packages are not installed, the following error message is returned:

```
[root@ localhost mnt]# rpm -e --nodeps --allmatches
libibverbs-devel
error: package libibverbs-devel is not installed
[root@localhost mnt]# rpm -e --nodeps --allmatches
libibverbs
error: package libibverbs is not installed
[root@ localhost mnt]#
```

3. Execute Installer and enter *y*.

In the following example, the Installer is *mlnxofedinstall*:

```
[root@localhost mnt]# ./mlnxofedinstall -without-32bit
This program will install the MLNX_OFED_LINUX package on your
machine.
```

Note that all other Mellanox, OEM, OFED, or Distribution IB packages will be removed.

Do you want to continue?[y/N]:y

Uninstalling the previous version of OFED

```
:
:
:
```

Starting MLNX_OFED_LINUX-1.5.3-1.0.0.2 installation ...

Installing kernel-ib RPM

Preparing... #####

kernel-ib #####

Installing kernel-ib-devel RPM

Preparing... #####

```
:
:
:
```

Installation finished successfully.

```
[root@ localhost mnt]#
```

4. Unmount */mnt* directory.

```
[root@localhost mnt]# cd /
[root@localhost ~]# umount /mnt
[root@localhost ~]#
```

5. Restart the OS.

```
[root@localhost ~]# reboot
```

6. Check the modification of limits.conf file.

```
[root@localhost ~]# tail -2 /etc/security/limits.conf
* soft memlock unlimited
* hard memlock unlimited
[root@localhost ~]#
```

Please re-install from step3 when the 2 messages above were not displayed.

2.3.3.2 Updating of OFED on RHEL6.1

1. Mount *iso* file and move to */mnt*.

In the following example, the OFED is *MLNX_OFED_LINUX-1.5.3-1.0.0-rhel6.1-x86_64.iso*:

```
[root@localhost ]# mount -o ro,loop MLNX_OFED_LINUX-1.5.3-1.0.0-rhel6.1-x86_64.iso /mnt
[root@localhost ]# cd /mnt/
[root@localhost mnt]#
```

2. Install *glibc-devel-2.12-1.25.el6.i686* package by using RHEL6.1 installation media.

```
[root@localhost mnt]# cd /mnt/RHEL_6.1\ x86_64\ Disc\ 1\Packages/
[root@localhost Packages]# rpm -ivh glibc-devel-2.12-1.25.el6.i686.rpm
warning: glibc-devel-2.12-1.25.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
Preparing... ##### [100%]
 1:glibc-devel ##### [100%]
[root@localhost Packages]#
```

3. Move to */root* and force the following packages to be uninstalled:

- *libibverbs*
- *libibcm*
- *librdmacm*
- *infinipath-psm*
- *fcoe-utils*

```
[root@ localhost Packages]# cd /
[root@ localhost ~]# rpm -e --nodeps libibverbs libibcm
librdmacm infinipath-psm fcoe-utils
[root@ localhost ~]#
```



If these packages are not installed, the following error message is returned:

```
[root@ localhost mnt]# rpm -e --nodeps --allmatches
libibverbs-devel
error: package libibverbs-devel is not installed
[root@localhost mnt]# rpm -e --nodeps --allmatches
libibverbs
error: package libibverbs is not installed
[root@ localhost mnt]#
```

4. Move to */mnt* and execute Installer and enter *y*

In the following example, the Installer is *mlnxofedinstall*.

```
[root@ localhost ~]# cd /mnt
[root@localhost mnt]# ./mlnxofedinstall -without-32bit
This program will install the MLNX_OFED_LINUX package on your
machine.
```

Note that all other Mellanox, OEM, OFED, or Distribution IB packages will be removed.

Do you want to continue?[y/N]:y

Uninstalling the previous version of OFED

```
:
:
:
```

Starting MLNX_OFED_LINUX-1.5.3-1.0.0 installation ...

Installing kernel-ib RPM


```

Preparing... #####
kernel-ib #####
Installing kernel-ib-devel RPM
Preparing... #####
kernel-ib-devel #####
:
:
:
Installation finished successfully.

```

```
[root@localhost mnt]#
```

5. Unmount */mnt* directory.

```

[root@localhost mnt]# cd /
[root@localhost ~]# umount /mnt
[root@localhost ~]#

```

6. Restart the OS.

```
[root@localhost ~]# reboot
```

7. Check the modification of *limits.conf* file.

```

[root@localhost ~]# tail -2 /etc/security/limits.conf
* soft memlock unlimited
* hard memlock unlimited
[root@localhost ~]#

```

Please re-install from step3 when the 2 messages above were not displayed.

2.3.4 Post-installation notes

How to change MR

This section describes how to set *mlx4* parameters.

Add line to file

If you set to RHEL6.1 + MellanoxOFED, please add line to */etc/modprobe.d/mlx4.conf*.

If there is no *mlx4.conf*, please create the file.

How to set *mlx4* parameters

options *mlx4_core* parameter=<value>

mlx4_core Parameters

► *log_num_mtt*

Log maximum number of memory translation table segments per HCA (default is 20; max is 20).

► *log_mmts_per_seg*

Log number of MTT entries per segment (1-7) (int) (default is 3; max is 7).

Example of */etc/modprobe.d/mlx4.conf*

Add the following parameters:

```
options mlx4_core log_num_mtt=20 log_mmts_per_seg=4
```

After the parameter has been changed, you will need to reboot.

IPoIB adapters parameter limitation

If you create (or edit) the *ifcfg-ib** files to configure an IPoIB, the parameter 'NM_CONTROLLED' should be set to 'no'.

The limitation is applied only to RHEL6.

Example: */etc/sysconfig/network-scripts/ifcfg-ib0*

```
DEVICE="ib0"  
IPADDR="192.168.210.100"  
PREFIX=255.255.255.0  
BROADCAST=192.168.210.255  
NM_CONTROLLED="no"  
ONBOOT="yes"
```

IPoIB function gets unavailable if *ib0* is configured on BX92xS3 servers in BX900 S2 chassis.

Don't configure *ifcfg-ib0* in order to avoid this problem.

2.4 Updating Firmware after Installation

If you wish to burn newer firmware, you have to download it from Fujitsu Technology Solutions Web site

(<http://support.ts.fujitsu.com/com/support/downloads.html> > Driver & Downloads).

If you purchased the products from Fujitsu Japan, you download it from <http://jp.fujitsu.com/platform/server/primergy/downloads/>.

2.5 Subnet Manager

At least one Subnet Manager(SM) is present on each subnet. Each SM resides on a port of IB Mezzanine card or IB connection blade. When there are multiple SMs on a subnet, the master SM is one, and the remaining SMs become standby SMs. The master SM has a role to initialize and configure an Infiniband subnet.

OpenSM is an InfiniBand compliant SM. The following sections describe how to use OpenSM.

2.5.1 OpenSM

OpenSM is one Subnet Manager distributed with RedHat.

This chapter describes how to configure which server becomes the master SM. Please set up the server which will be the master using the following reference. Regarding the other settings of OpenSM, please refer to the command help of *opensmd*.

Basically, a server with the lowest GUID will be the master SM within a subnet. if you intend to choose the master SM, you can configure the priority which range is from 0 to 15. 0 is the lowest and 15 is the highest.

Example for RHEL5:

```
# /etc/init.d/opensmd start -p 15
```

2.5.2 Confirmation of OpenSM running

Enter the following command to confirm that OpenSM is running:

```
# /etc/init.d/opensmd status
```

OpenSM is running properly, if the result of this command displays "running".

enter the following command to run OpenSM, if the result displays "stopped":

```
# /etc/init.d/opensmd start
```

2.5.3 Confirmation of the master SM

Enter the *ibstat* command on the system server, then "Base LID" and "SM LID" are displayed.

The IB Mezzanine card or IB connection blade on which these two LIDs are the same is the master SM.

2.6 Network Configuration Information

The following information (1)-(6) is needed to maintain and troubleshooting an InfiniBand network.

The information should be saved when configuring the InfiniBand network.

1. Network configuration diagram
2. Configuration sheet
3. The server on which the MASTER is found
4. The server on which the STANDBY is found
5. The result of the *ibnetdiscover* command
6. GUID list and arrangement drawing of device location plan

2.6.1 Network configuration diagram

Example:

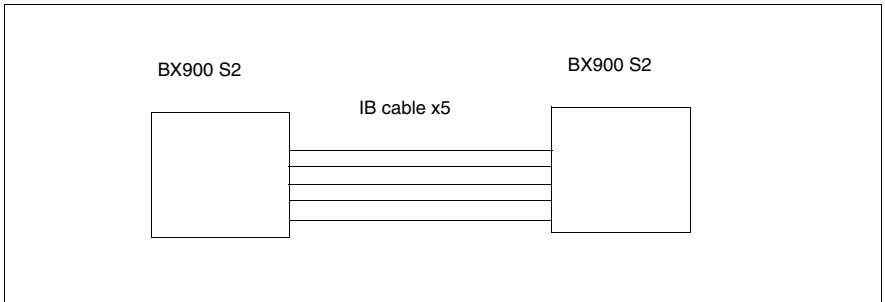


Figure 8: Network configuration diagram

2.6.2 Configuration sheet

Server blade	mezz# 1 GUID	mezz# 2 GUID	OS	host-name	Static /DHCP	iRMC	eth0	eth1	eth2	eth3	ib0	ib1	ib2	ib3
Slot1														
Slot2														
Slot3														
Slot4														
Slot5														
Slot6														
Slot7														
Slot8														
Slot9														
Slot10														
Slot11														
Slot12														
Slot13														
Slot14														
Slot15														
Slot16														
Slot17														
Slot18														
	GUID			host-name	Static /DHCP		eth0	ib0	ntp	snmp				
CB3														
CB5														
MMB1-Agent														
MMB1-Service														

Table 3: Configuration sheet

IP Address= . . .XX

Root password:

How to fill in:

- Please fill in the GUID of the Mezzanine Card installed in Mezzanine I slot in the column of "mezz#1 GUID". Similarly, please fill in the GUID of the Mezzanine Card installed in Mezzanine II slot in the column of "mezz#2 GUID".
- Please fill in the host name in the column of "hostname" when you assign the host name to each server blade.
- Please fill in the IP addresses(XX) in the column of "iRMC", "eth0", "eth1", "eth2", "eth3", "ib0", "ib1", "ib2", and "ib3" when you use the static IP.
IP Address = 192.168.11.XX

Server Blade	mezz#1 GUID	mezz#2 GUID	OS	Hostname	Static /DHCP	iRMC	eth0	eth1	eth2	eth3	ib0	ib1	ib2	ib3
Slot01	0002c9030003b7fa	0002c9030003b1b6	RHEL5.4	bx920-02-01	static	101	102	103	104	105	-	-	-	-
Slot02	0002c903000413c0	0002c90300041514	RHEL5.4	bx920-02-02	static	106	107	108	109	110	-	-	-	-
Slot03														
Slot04														
Slot05														
Slot06														
Slot07														
Slot08														
Slot09														
Slot10														
Slot11														
Slot12														
Slot13														
Slot14														
Slot15														
Slot16														
Slot17														
Slot18														
	GUID			hostname	Static /DHCP		eth0	ib0	n1p	snmp				
CB3					static		33	-	-	-				
CB5					static		34	-	-	-				
MMB1-Agent														
MMB1-Service														

Figure 9: Example of configuration sheet

2.6.3 Identifying the GUID

The IB Mezzanine card has 4 different GUIDs (Globally Unique Identifier): Node GUID, System GUID, GUID for Port1 and GUID for Port2). The Node GUID is listed on the label on the back of the product.



Figure 10: Label on the back of the IB Mezzanine Card

How to identify the node GUID:

- ▶ Log in to the server blade as root.
- ▶ Run the open terminal or telnet/ssh.
- ▶ Execute the *ibstat* command, and identify the node GUID ("Node GUID: 0x*****"). The *ibstat* command is available after installation of OFED or WinOF.

In case one Mezzanine Card is installed (Mezz slot1 or slot2), the Mezzanine Card is named "mlx4_0".

In case two Mezzanine Cards are installed(both of Mezz slot1 and slot2), the Mezzanine Cards are named below :

Mezz slot Mezzanine Card name

- | | |
|---|----------|
| 1 | "mlx4_0" |
| 2 | "mlx4_1" |

In the following example: the node GUID of Mezz slot1 is "0002c903002ff3e0", and Mezz slot2 is "0002c903002ff2a0".

```
[root@localhost ~]# ibstat
```

```
CA 'mlx4_0'
```

```
    CA type: MT4099
```

```
    Number of ports: 2
```

```
    Firmware version: 2.9.8220
```

```
    Hardware version: 0
```

```
    Node GUID: 0x0002c903002ff3e0
```

```
    System image GUID: 0x0002c903002ff3e3
```

```
    Port 1:
```

```
        State: Down
```

```
        Physical state: Polling
```

```
        Rate: 40
```

```
        Base lid: 0
```

```
        LMC: 0
```

```
        SM lid: 0
```

```
        Capability mask: 0x02514868
```

```
        Port GUID: 0x0002c903002ff3e1
```

```
    Port 2:
```

```
        State: Initializing
```

```
        Physical state: LinkUp
```

```
        Rate: 40
```

```
        Base lid: 0
```

```
        LMC: 0
```

```
        SM lid: 0
```

```
        Capability mask: 0x02514868
```

```
        Port GUID: 0x0002c903002ff3e2
```

CA 'mlx4_1'

CA type: MT4099

Number of ports: 2

Firmware version: 2.9.8220

Hardware version: 0

Node GUID: 0x0002c903002ff2a0

System image GUID: 0x0002c903002ff2a3

Port 1:

State: Down

Physical state: Polling

Rate: 40

Base lid: 0

LMC: 0

SM lid: 0

Capability mask: 0x02514868

Port GUID: 0x0002c903002ff2a1

Port 2:

State: Down

Physical state: Polling

Rate: 40

Base lid: 0

LMC: 0

SM lid: 0

Capability mask: 0x02514868

Port GUID: 0x0002c903002ff2a2

[root@localhost ~]#

2.6.4 The result of the command "ibnetdiscover"

GUID list

It is useful to provide the text file (:.txt) which associates a GUID with the name of the device so that the *ibnetdiscover* command displays the result more meaningfully.

format of the text

GUID(hex number) "Hostname and Mezzanine slot"

Regarding the Mezzanine slot, please refer to ["Identifying the GUID" on page 31](#)

For example: mmap.txt

```
# bx900-02 IB Mezzanine
0x0002c903000413c0 "bx900-02-01 Mezz-1"
0x0002c90300041514 "bx900-02-01 Mezz-2"
0x0002c9030003bf7a "bx900-02-02 Mezz-1"
0x0002c9030003bf6a "bx900-02-02 Mezz-2"
0x0002c903000413b8 "bx900-02-03 Mezz-1"
0x0002c90300041488 "bx900-02-03 Mezz-2"
0x0002c90300041408 "bx900-02-04 Mezz-1"
0x0002c903000412f0 "bx900-02-04 Mezz-2"
0x0002c90300041414 "bx900-02-05 Mezz-1"
0x0002c90300041348 "bx900-02-05 Mezz-2"

# BX900-02 IB Connection Blade
0x0002c9020040c7a8 "bx900-02-IB-SW-CB3"

# BX900-04 IB Connection Blade
0x0002c9020040c790 "bx900-04-IB-SW-CB3"

# bx900-04 Mezzanine
0x0002c903000413ec "bx900-04-01 HCA-1"
0x0002c903000447b0 "bx900-04-02 HCA-1"
```

"ibnetdiscover" command execution procedure

1. Connect to the CLI of IB connection blade via MMB (MMB Console Redirection).
2. Execute the command *swinfo*

```
<BX900S2-CB3> swinfo  
<BX900S2-CB3 Information:  
  GUID: 0x0002c9020040c7a8  
  MAC: 00:02:c9:11:20:5a  
  IS4 Firmware revision: 7.2.326  
  CPU Firmware revision: Mellanox release mlnx405ex-1.0.2 build 2009-07-19
```
3. In the example above the GUID of IB connection blade is
"0x0002c9020040c7a8"
4. Execute the command *ibnetdiscover* on the server blade by use of mmap.txt.

```

[root@bx900-02-01~]# ibnetdiscover --node-name-map=/root/mmap.txt
#
# Topology file: generated on Sat Aug 1 01:27:33 2009
#
# Max-of-3-hops-discovered
# Initiated from node-0002c903000413c0-port-0002c903000413c2
#
vendid=0x2c9
devid=0xbd36
sysimguid=0x2c9020040c7a8
switchguid=0x2c9020040c7a8(2c9020040c7a8)
Switch::36-"S-0002c9020040c7a8".....#"bx900-02-IB-SW-CB3"-enhanced-port-0-lid-14-jmc-0
[23]-a-"S-0002c9020040c790"[23].....#"bx900-04-IB-SW-CB3"-lid-9-4xFDR
[22]-"S-0002c9020040c790"[22].....#"bx900-04-IB-SW-CB3"-lid-9-4xFDR
[21]-"S-0002c9020040c790"[21].....#"bx900-04-IB-SW-CB3"-lid-9-4xFDR
[20]-"S-0002c9020040c790"[20].....#"bx900-04-IB-SW-CB3"-lid-9-4xFDR
[19]-"S-0002c9020040c790"[19].....#"bx900-04-IB-SW-CB3"-lid-9-4xFDR
[18]-"H-0002c9030003bf82"[2](2c9030003bf84).....#"bx900-02-18-HCA-1"-lid-7-4xFDR
[17]-"H-0002c903000413fc"[2](2c903000413fe).....#"bx900-02-17-HCA-1"-lid-22-4xFDR
[16]-"H-0002c903000412fc"[2](2c903000412fe).....#"bx900-02-16-HCA-1"-lid-21-4xFDR
[15]-"H-0002c90300041460"[2](2c90300041462).....#"bx900-02-15-HCA-1"-lid-5-4xFDR
[14]-"H-0002c9030003bf96"[2](2c9030003bf98).....#"bx900-02-14-HCA-1"-lid-11-4xFDR
[13]-"H-0002c9030003d138"[2](2c9030003d13a).....#"bx900-02-13-HCA-1"-lid-4-4xFDR
[12]-"H-0002c9030003bf92"[2](2c9030003bf94).....#"bx900-02-12-HCA-1"-lid-10-4xFDR
[11]-"H-0002c9030003bfba"[2](2c9030003bfbc).....#"bx900-02-11-HCA-1"-lid-17-4xFDR
[10]-"H-0002c903000413e8"[2](2c903000413ea).....#"bx900-02-10-HCA-1"-lid-18-4xFDR
[9]-"H-0002c9030003bfa6"[2](2c9030003bfa8).....#"bx900-02-09-HCA-1"-lid-13-4xFDR
[8]-"H-0002c9030003bf86"[2](2c9030003bf88).....#"bx900-02-08-HCA-1"-lid-8-4xFDR
[7]-"H-0002c9030003bf9e"[2](2c9030003bfa0).....#"bx900-02-07-HCA-1"-lid-12-4xFDR
[6]-"H-0002c903000412ec"[2](2c903000412ee).....#"bx900-02-06-HCA-1"-lid-19-4xFDR
[5]-"H-0002c90300041414"[2](2c90300041416).....#"bx900-02-05-HCA-1"-lid-3-4xFDR
[4]-"H-0002c90300041408"[2](2c9030004140a).....#"bx900-02-04-HCA-2"-lid-2-4xFDR
[3]-"H-0002c903000413b8"[2](2c903000413ba).....#"bx900-02-03-HCA-1"-lid-16-4xFDR
[2]-"H-0002c9030003bf7a"[2](2c9030003bf7c).....#"bx900-02-02-HCA-1"-lid-6-4xFDR
[1]-"H-0002c903000413c0"[2](2c903000413c2).....#"bx900-02-01-HCA-1"-lid-1-4xFDR
#
vendid=0x2c9
devid=0xbd36
sysimguid=0x2c9020040c790
switchguid=0x2c9020040c790(2c9020040c790)
Switch::36-"S-0002c9020040c790".....#"bx900-04-IB-SW-CB3"-enhanced-port-0-lid-9-jmc-0
[2]-"H-0002c903000447b0"[2](2c903000447b2).....#"bx900-04-02-HCA-1"-lid-15-4xQDR
[1]-"H-0002c903000413ec"[2](2c903000413ee).....#"bx900-04-01-HCA-1"-lid-20-4xQDR
[23]-"S-0002c9020040c7a8"[23].....#"bx900-02-IB-SW-CB3"-lid-14-4xQDR
[22]-"S-0002c9020040c7a8"[22].....#"bx900-02-IB-SW-CB3"-lid-14-4xQDR
[21]-"S-0002c9020040c7a8"[21].....#"bx900-02-IB-SW-CB3"-lid-14-4xQDR
[20]-"S-0002c9020040c7a8"[20].....#"bx900-02-IB-SW-CB3"-lid-14-4xQDR
[19]-"S-0002c9020040c7a8"[19].....#"bx900-02-IB-SW-CB3"-lid-14-4xQDR

```

Figure 11: ibnetdiscover command: GUID list and arrangement drawing of devices

The result format of *ibnetdiscover*

1. Provide the GUID list file (mmap.txt) in advance.
2. Search for the GUID obtained by the command *swinfo* in the result of *ibnetdiscover* ("S-" indicates IB connection blade, see RED underline)
3. There is a string "lid 14" in the same line as the GUID referred above. 14 indicates the LID of IB connection blade (see GREEN marker).
4. The leftmost figure in each line "[23] to [1]" indicate the port number which is connected to a device.
The maximum number of the port is 36. Thus if all ports are connected, "[1] to [36]" is displayed.
In this example, there are connections as follows (see *a*).
5. "4x QDR" indicates the Quad Data Rate connection.
In case this value is "SDR" or "DDR" or "QDR", there is something wrong with the cable connection (see *b*).

GUID list of IB connection blade, the layout chart, and rack loading list is useful for the maintenance.

3 Windows Installation

3.1 Overview

This chapter describes how to install a single host machine with Fujitsu InfiniBand hardware installed. A server can be properly installed with all required InfiniBand drivers and software during Windows (HPC) Server 2008 R2 SP1 installation or afterwards by using the Win OpenFabrics installation or OpenSM setup.



Please note that only **Windows Server 2008 R2 SP1** and **Windows HPC Server 2008 R2 SP1** are supported!

3.1.1 Software Requirements

Required Disk Space for Windows Installation

100 MB

Operating System

Windows (HPC) Server 2008 R2 SP1

Installer Privileges

Installation requires administrator privileges on the target machine.

3.2 Installation of WinOF

Please install WinOF by the following steps after the OS installation.

Download OFED from Fujitsu Technology Solutions Web site

(<http://support.ts.fujitsu.com/com/support/downloads.htm> > Driver & Downloads).

If you purchased the products from Fujitsu Japan, you download it from

<http://jp.fujitsu.com/platform/server/primergy/downloads/>

1. After inserting InfiniBand cards, make sure that “Other devices -> Unknown device” is shown in the Device Manager.



Figure 12: Display of InfiniBand devices before installation of WinOF

2. Double click the *Unknown* device. Click *Details* tab and select *Hardware Ids* in *Property*. Make sure there are “VEN_153B” and “DEV_1003” in *Value*, which shows the device is an InfiniBand card.
3. Log on to Windows as administrator, and then double-click the file of downloaded WinOF.

4. Click [Next>] after the following window appears.

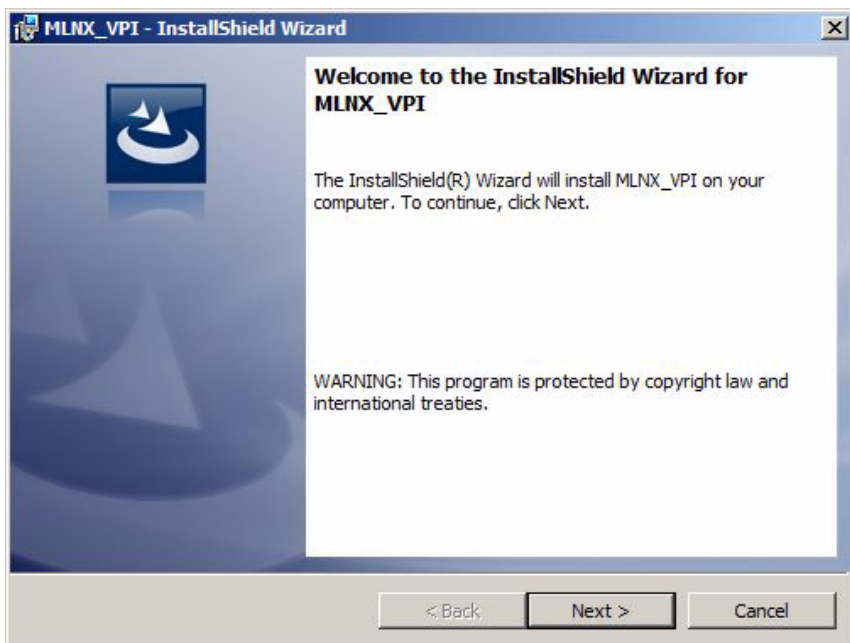


Figure 13: InstallShield Wizard

5. After the following window appears, read License Agreement carefully. If you accept, tick "I accept the terms in the license agreement" and then click [Next>].

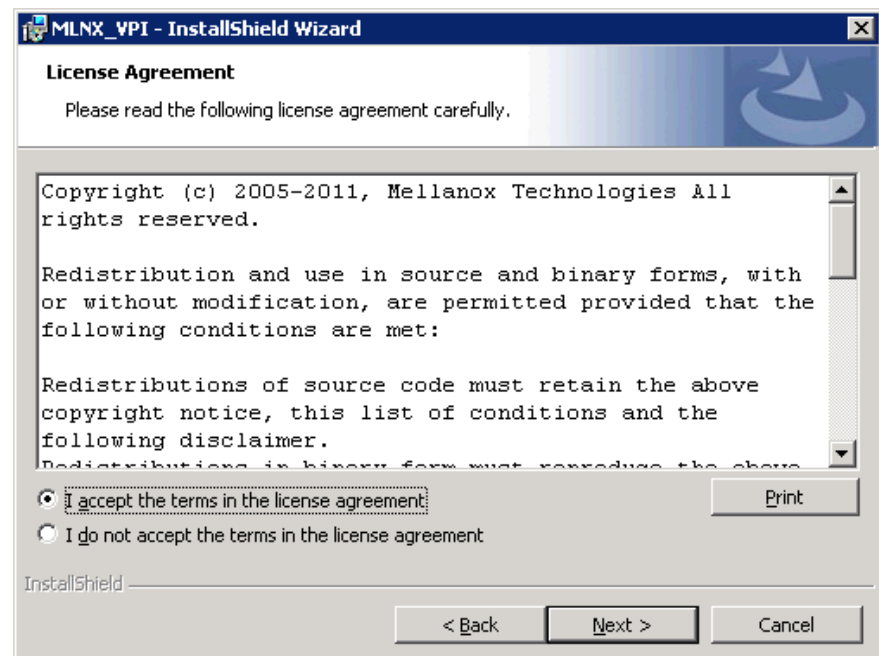


Figure 14: License Agreement

6. Click [Next>] after the following window appears (if you want to change the installation folder, specify the folder you want to install on by clicking [Change...]).

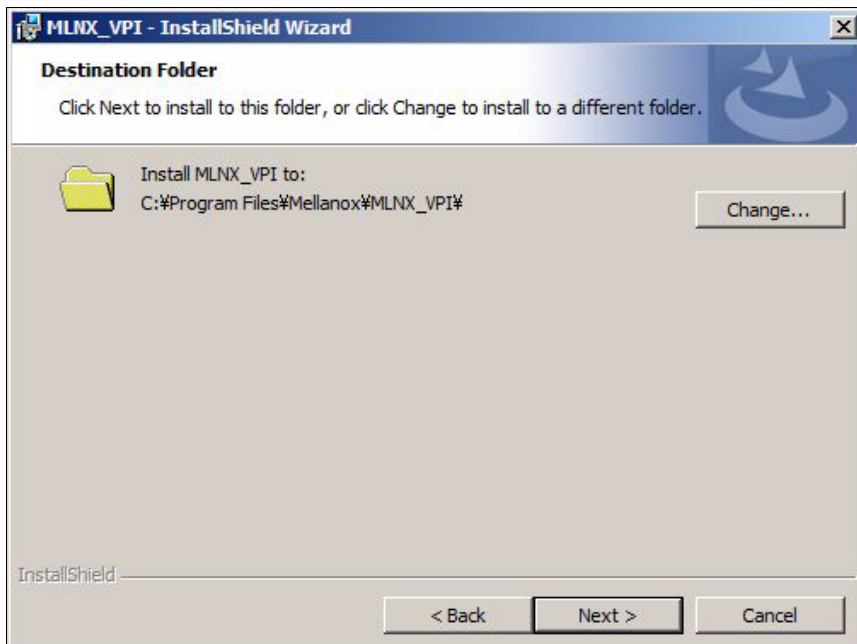


Figure 15: Destination Folder

7. After the following window appears, untick "Check this box to configure your system for maximum 10GigE performance (Recommended)", and then click [Next>].

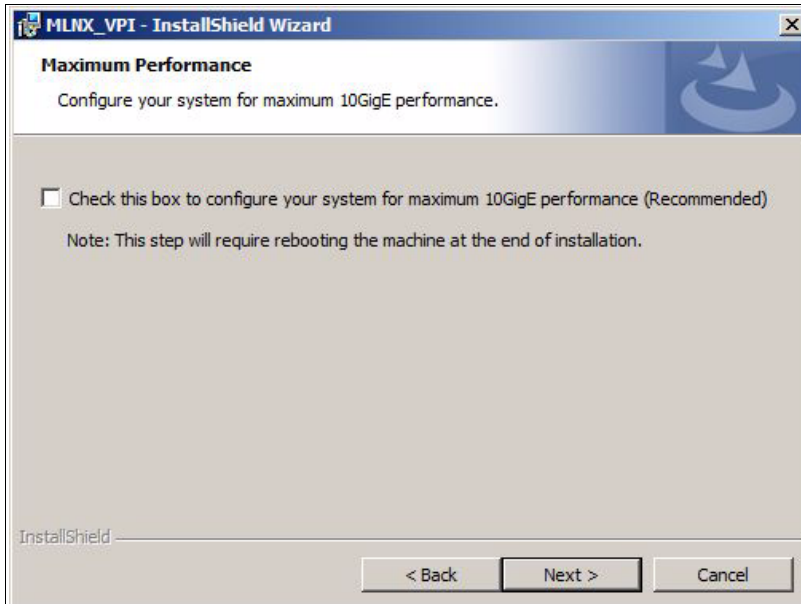


Figure 16: Maximum performance

8. Click [Install] after the following window appears.

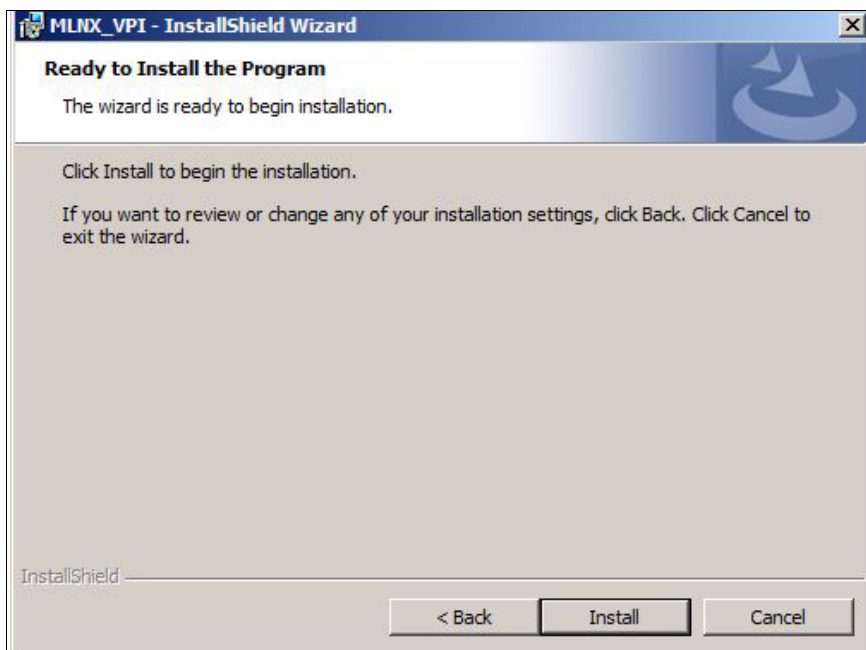


Figure 17: Installation

9. The following window appears after the installation process is finished. Click [Finish] without checking any boxes.

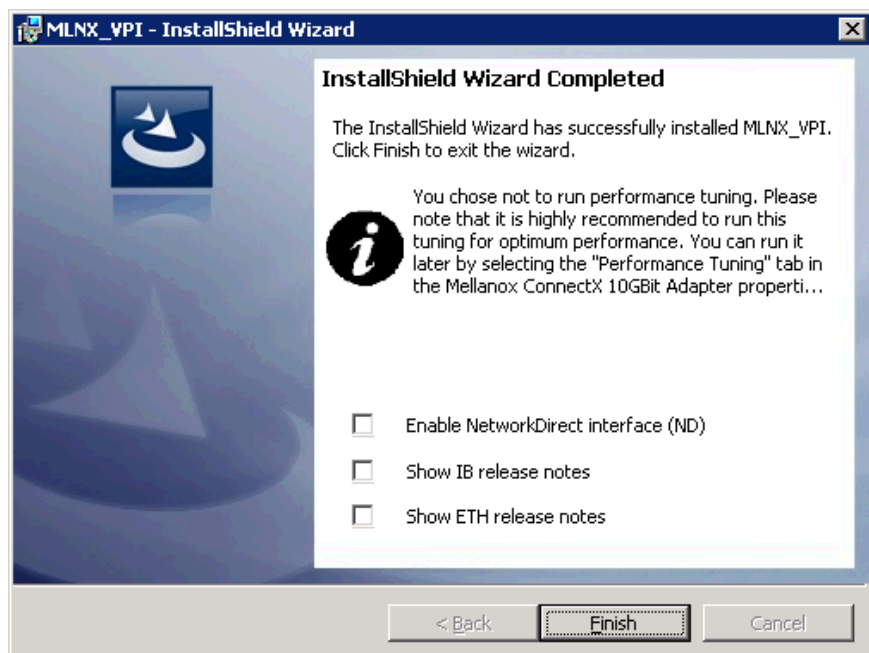


Figure 18: Installation completed

10. Make sure that InfiniBand devices are recognized properly in Device Manager.

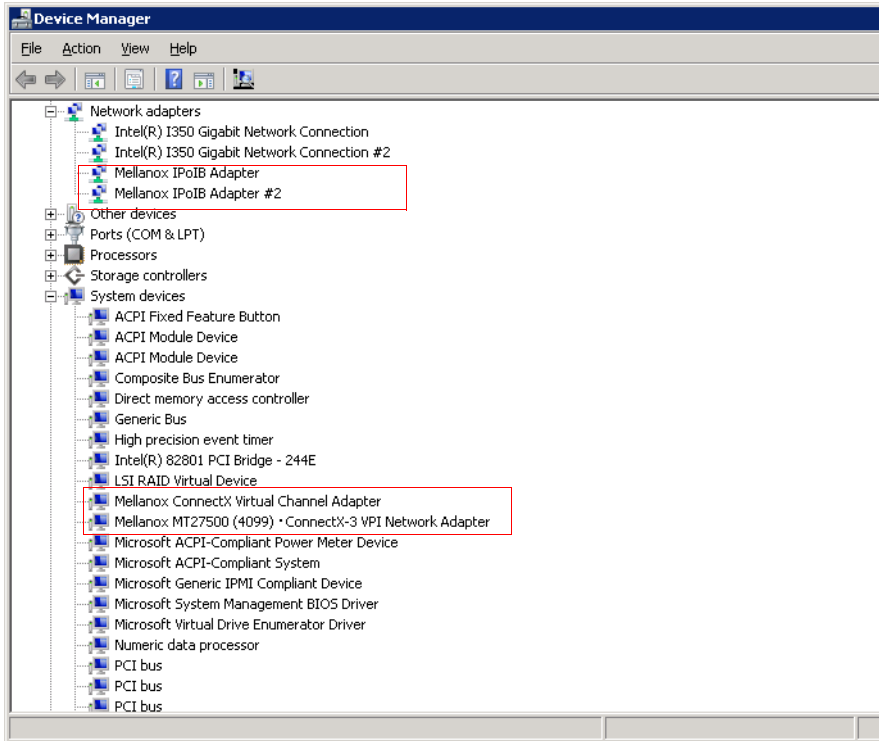


Figure 19: InfiniBand devices

11. After WinOF installation, OpenSM should be set up.

The 'OpenSM' service is registered to the **[Services]** Window after WinOF installation.

Double-click 'OpenSM' to open properties.

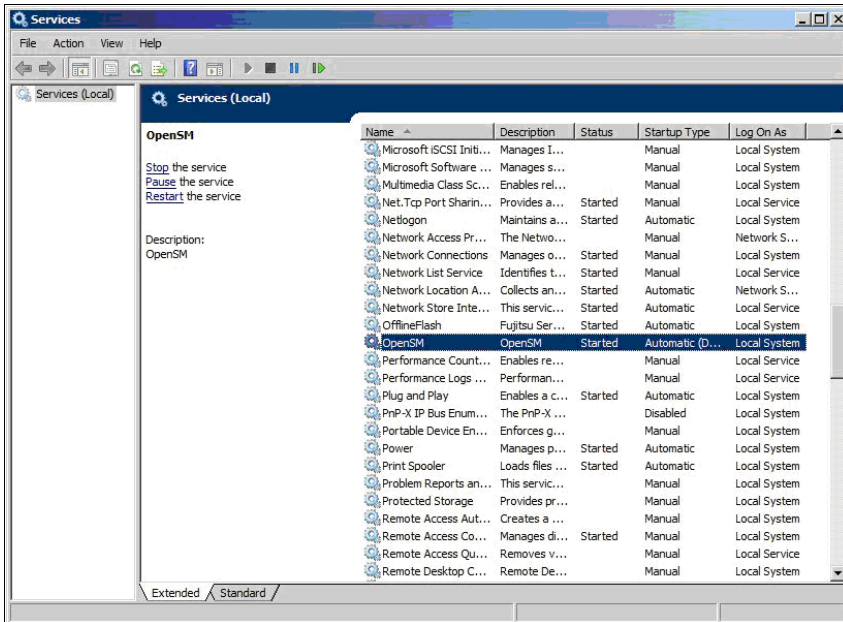


Figure 20: Configuration of OpenSM

12. Change 'Startup type' from *Manual* to *Automatic (Delay Start)*.

13. Click the 'Start' button to start the OpenSM service.

14. Open the 'Network Connections' Window to check if IPoIB networks are linked up.

Disable the unused IPoIB adapters.

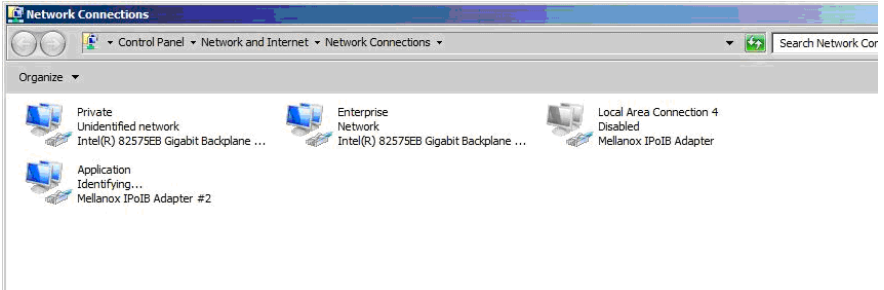


Figure 21: Network status

15. Since no IP address is assigned to this new IPoIB adapter, assign an IP address to it.
16. Run the command prompt as the Administrator privilege and execute the following command to enable 'Network Direct'.

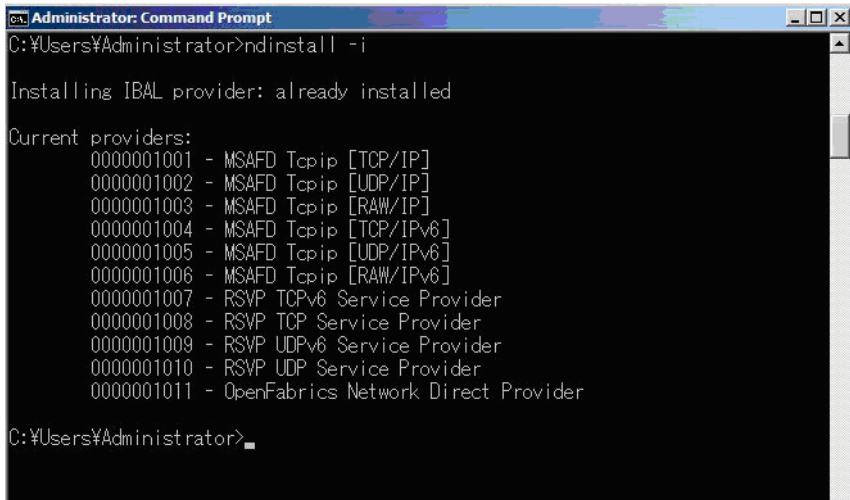
```
> ndinstall -i
```



Figure 22: Installation of Network Direct 1

17. In order to check if 'Network Direct' is enabled properly, execute the same command again.

The message 'Installing IBAL provider: already installed' is shown if it is enabled properly.



```
Administrator: Command Prompt
C:\Users\Administrator>ndinstall -i

Installing IBAL provider: already installed

Current providers:
0000001001 - MSAFD Tcpip [TCP/IP]
0000001002 - MSAFD Tcpip [UDP/IP]
0000001003 - MSAFD Tcpip [RAW/IP]
0000001004 - MSAFD Tcpip [TCP/IPv6]
0000001005 - MSAFD Tcpip [UDP/IPv6]
0000001006 - MSAFD Tcpip [RAW/IPv6]
0000001007 - RSVP TCPv6 Service Provider
0000001008 - RSVP TCP Service Provider
0000001009 - RSVP UDPv6 Service Provider
0000001010 - RSVP UDP Service Provider
0000001011 - OpenFabrics Network Direct Provider

C:\Users\Administrator>
```

Figure 23: Installation of Network Direct 2

4 IB Connection Blade Management

4.1 Connection

In this chapter the connection of IB connection blade via Management Blade is explained. Follow the procedures below.

Configurations for connecting to IB connection blade are explained in [section "Configuration" on page 54](#).

1. Login to Management Blade CLI via *ssh*.

Please refer to "Server View Management Blade" to see about the connection and the booting up of Management Blade CLI.

2. Select "(3) Set Console Redirection Timeout" and press the key.
3. Select "(1) Console Redirect Connection Blade" and press the key.

```
+-----+
|          Console Redirection Table          | page_3
+-----+
(1) Console Redirect Connection Blade
(2) Set Return Hotkey , Ctrl+(a character) : 0
(3) Set Console Redirection Timeout       : 900
Enter selection or type (0) to quit: 1
```

Figure 24: Console redirection

4. Enter the slot number on which IB connection blade is installed and press the key.
(Example : If IB connection blade is installed on slot3/4, enter "3" and press the key)

```
+-----+
|           Console Redirect Connection Blade           page_3_1           |
+-----+
(1) CB1:PY CB Eth Switch/IBP 1Gb 36/12(Mode:Switch) - Stacking:N/A
(3) CB3:PY CB IB Switch 56Gb 18/18 - Stacking:N/A
(5) CB5:PY CB IB Switch 56Gb 18/18 - Stacking:N/A
Enter selection or type (0) to quit: 3
```

Figure 25: Console redirect connection blade

4.1.1 **Configuring the Switch for the First Time**

1. Login (from MMB page_3_1) as admin and use admin as password. This starts the configuration wizard. However, the wizard may not start depending on a platform.
2. Go through the configuration wizard. Table 4 shows an example of a wizard session.

Wizard Session Display (Example)	Comments
Mellanox configuration wizard Do you want to use the wizard for initial configuration? yes	You must perform this configuration the first time you operate the switch or after resetting the switch to the factory defaults. Type 'y' and then press <Enter>.
Step1: Hostname? [switch-1]	If you wish to accept the default hostname, then press <Enter>. Otherwise, type a different hostname and press <Enter>.

Table 4: : Configuration Wizard Session - IP Configuration by DHCP

Wizard Session Display (Example)	Comments
Step 2: Use DHCP on mgmt0 interface? [yes]	<p>Perform this step to obtain an IP address for the switch. (mgmt0 is the management port of the switch.)</p> <p>If you wish the DHCP server to assign the IP address, type 'yes' and press <Enter>.</p> <p>If you type 'no' (no DHCP), then you will be asked whether you wish to use the 'zeroconf' configuration or not.</p> <p>If you enter 'no' (no Zeroconf), then you need to enter a static IP.</p>
Step 3: Enable IPv6 [yes]	<p>Perform this step to enable IPv6 on management ports.</p> <p>If you wish to enable IPv6, type 'yes' and press <Enter>.</p> <p>If you enter 'no' (no IPv6), then you will automatically be referred to Step 5.</p>
Step 4: Enable IPv6 autoconfig (SLAAC) on mgmt0 interface	<p>Perform this step to enable StateLess address autoconfig on external management port.</p> <p>If you wish to enable it, type 'yes' and press <Enter>.</p> <p>If you wish to disable it, enter 'no'.</p>
Step 5: Admin password (Press <Enter> to leave unchanged)? <new_password> Step 6: Confirm admin password? <new_password>	<p>To avoid illegal access to the machine, please type a password and then press <Enter>. Then confirm the password by re-entering it.</p>

Table 4: : Configuration Wizard Session - IP Configuration by DHCP

Wizard Session Display (Example)	Comments
<p>You have entered the following information:</p> <p>1.Hostname: <switch name></p> <p>2.Use DHCP on mgmt0 interface: yes</p> <p>3.Admin password (Enter to leave unchanged):</p> <p>(CHANGED)</p> <p>To change an answer, enter the step number to return to.</p> <p>Otherwise hit <enter> to save changes and exit.</p> <p>Choice: <Enter></p> <p>Configuration changes saved.</p> <p>To return to the wizard from the CLI, enter the "configuration jump-start" command from configuration mode.</p> <p>Launching CLI...</p> <p><switch name> [standalone: master]</p> <p>></p>	<p>The wizard displays a summary of your choices and then asks you to confirm the choices or to re-edit them.</p> <p>Either press <Enter> to save changes and exit, or enter the configuration step number that you wish to return to.</p>

Table 4: : Configuration Wizard Session - IP Configuration by DHCP

Example:

```
Mellanox configuration wizard

Do you want to use the wizard for initial configuration? y

Step 1: Hostname? [switch-5eb028] BX900S2-CB3
Step 2: Use DHCP on mgmt0 interface? no
Step 3: Use zeroconf on mgmt0 interface? [no]
Step 4: Primary IPv4 address and masklen? [0.0.0.0/0]
192.168.1.10
Step 5: Netmask or mask length? [255.255.255.0]
Step 6: Default gateway?
Step 7: Primary DNS server?
```

Step 8: Domain name?

Step 9: Enable IPv6? [yes]

Step 10: Enable IPv6 autoconfig (SLAAC) on mgmt0 interface?
[no]

Step 11: Admin password (Enter to leave unchanged)?

You have entered the following information:

1. Hostname: BX900S2-CB3
2. Use DHCP on mgmt0 interface: no
3. Use zeroconf on mgmt0 interface: no
4. Primary IPv4 address: 192.168.1.10
5. Netmask or mask length: 255.255.255.0
6. Default gateway:
7. Primary DNS server:
8. Domain name:
9. Enable IPv6: yes
10. Enable IPv6 autoconfig (SLAAC) on mgmt0 interface: no
11. Admin password (Enter to leave unchanged): (unchanged)

To change an answer, enter the step number to return to.

Otherwise hit <enter> to save changes and exit.

Choice:

Configuration changes saved.

To return to the wizard from the CLI, enter the "configuration
jump-start"

command from configure mode. Launching CLI...

If you want to rerun the wizard run the following commands:

```
BX900S2-CB3 [standalone: master] > enable
BX900S2-CB3 [standalone: master] # configure terminal
BX900S2-CB3 [standalone: master] (config) # configuration
jump-start
```

4.1.2 Ethernet Connection via Management Blade

IB connection blade provides the function of Ethernet connection via the Management LAN port on a Management Blade.

Ethernet connection enables the user to connect to IB connection blade via telnet/ssh with CLI.

An example that an IP address 192.168.1.100/24 is assigned to management console and 192.168.1.10/24 to IB connection blade is illustrated below.

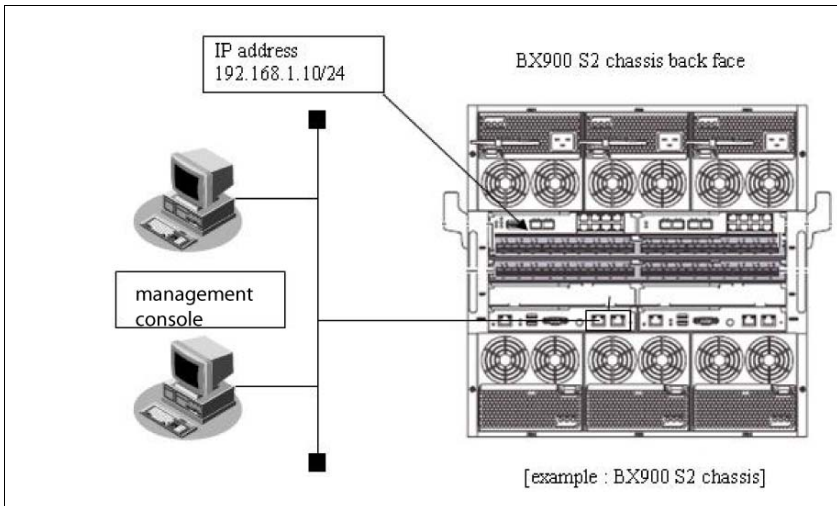


Figure 26: Ethernet connection

4.1.3 ssh connection

The user can execute the commands via *ssh* from the management console.

The method of connecting to IB connection blade via *ssh* is described below.

- ▶ Run a terminal software on the management console.
- ▶ Enter the command including the IP address referred to above "ssh -l admin 192.168.1.10" and press the **[Enter]** key.

The user connects to IB connection blade via *ssh*.

- ▶ Enter the password "admin" and press the **[Enter]** key.


```
[ibuser@localhost ~]$ ssh 192.168.1.10  
Mellanox MLNX-OS Switch Management
```

Password:

Mellanox Switch

BX900S2-CB3 [standalone: master] >

4.1.4 WebUI Connection

- ▶ Start a Web browser Google Chrome, Microsoft Internet Explorer 7.0 or Mozilla Firefox 3.0 or above.
- ▶ Enter as URL the following: `http://<switch_IP_address>` where `<switch_IP_address>` is the IP address of the switch or its DNS name.
- ▶ You will receive the login window for remote management of the switch. The following figure shows an example. Note that the default username is admin.

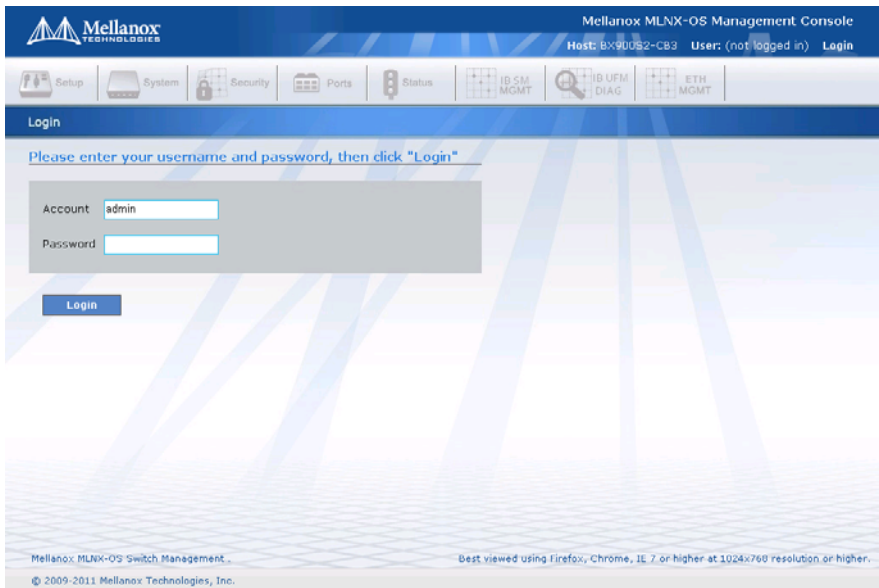


Figure 27: WebUI login window

4.2 Configuration

In order to configure the function of IB connection blade using CLI (Command Line Interface), the user needs to either connect the management console to Management Blade and run a terminal software or connect to Management Blade via *ssh*.

After finishing configuring the network configuration (e.g. IP address), it is possible to login via *ssh*.

4.2.1 Configuration of LAN interface

1. Change to Config mode. Enter:

```
BX900S2-CB3 [standalone: master] > enable
BX900S2-CB3 [standalone: master] # configure terminal
```

2. Disable setting IP addresses using the DHCP using the following command:

```
BX900S2-CB3 [standalone: master] (config) # no interface mgmt0 dhcp
```

3. Enter "interface" command to configure the IP address and netmask.

```
BX900S2-CB3 [standalone: master] (config) # interface mgmt0 ip address
192.168.1.10 255.255.255.0
```

4. Enter "ip default-gateway" command to configure the default-gateway.

```
BX900S2-CB3 [standalone: master] (config) # ip default-gateway 192.168.1.1
BX900S2-CB3 [standalone: master] (config) # show ip default-gateway
```

Active default gateways:

```
192.168.1.1 (interface: mgmt0)
```

5. Enter "show" command to check the IP address.

```
BX900S2-CB3 [standalone: master] (config) # show interfaces mgmt0
```

```
Interface mgmt0 state
```

```

Admin up:          yes
Link up:           yes
IP address:        192.168.1.10
Netmask:           255.255.255.0
IPv6 enabled:      yes
Autoconf enabled:  no
Autoconf route:    yes
Autoconf privacy:  no
IPv6 addresses:    1
IPv6 address:      fe80::202:c9ff:fe5e:b028/64
Speed:             100Mb/s (auto)
Duplex:            full (auto)
Interface type:    ethernet
Interface ifindex: 2
Interface source:  physical
MTU:               1500
HW address:        00:02:C9:5E:B0:28
Comment:

```

RX bytes:	5350137		TX bytes:	2472267
RX packets:	24020		TX packets:	8360
RX mcast packets:	0		TX discards:	0
RX discards:	0		TX errors:	0
RX errors:	0		TX overruns:	0
RX overruns:	0		TX carrier:	0
RX frame:	0		TX collisions:	0
			TX queue len:	1000

4.2.2 Save and restore the configuration

The configuration data can be saved and restored by *configuration* command.



Caution!

Look out for the following during the operation of save and restore:

- Do NOT turn off the power
- Check that there is no traffic between the nodes.
- Operate with NOT doing any setting from a management terminal.

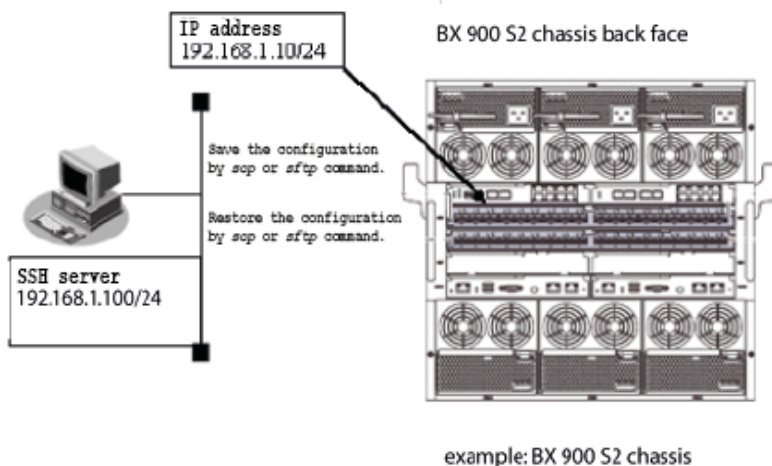


Figure 28: Save configuration

How to save the configuration

To save the current configuration to the active configuration file, you can either use the configuration write command (requires running in Config mode).

1. Execute "configuration write to myconf no-switch" command from IB connection blade. The following command saves the configuration to a user-specified file without making the new file the active configuration file.

```
BX900S2-CB3 [standalone: master] > enable
BX900S2-CB3 [standalone: master] # configure terminal
BX900S2-CB3 [standalone: master] (config) # configuration write to myconf no-switch
```

2. To display the available configuration files and the active file, enter:

```
BX900S2-CB3 [standalone: master] (config) # show configuration files
initial (active)
initial.bak
myconf
```

3. Copy configuration file (*myconf*) to server by *configuration upload* command.

```
BX900S2-CB3 [standalone: master] (config) # configuration upload myconf
scp://user:password@192.168.1.10/tmp/conf1
```

How to restore the configuration

By default, or after a system reset, the system loads the default "initial" configuration file. To load a different configuration file and make it the active configuration, change to Config mode and enter:

1. Copy configuration file (*myconf*) to server by *configuration fetch* command. It cannot download, when a configuration file already exists in an IB connection blade.

```
BX900S2-CB3 [standalone: master] > enable
BX900S2-CB3 [standalone: master] # configure terminal
BX900S2-CB3 [standalone: master] (config) # configuration fetch
scp://user:password@192.168.1.10/tmp/conf1/myconf
```

2. To display the available configuration files and the active file, enter:

```
BX900S2-CB3 [standalone: master] (config) # show configuration files
initial (active)
initial.bak
myconf
```

3. Execute *configuration switch-to myconf* command from IB connection blade.

```
BX900S2-CB3 [standalone: master] (config) # configuration switch-to myconf
BX900S2-CB3 [standalone: master] (config) # show configuration files
initial
initial.bak
myconf (active)
```

4.3 Basic Operation

This chapter describes the basic operation by the commands and how to get the information for the maintenance.

4.3.1 How to check System Information

This section describes how to check system information for this product.

The firmware version can be checked for this product.

Requires running in enable or config mode.

Prompt of a command in Enable mode:

```
hostname #
```

Prompt of a command in Config mode:

```
hostname (config) #
```

show system guid

This command shows GUID.

```
<BX900S2-CB3> [standalone: master] # show system guid  
00:02:C9:03:00:5D:0C:A0
```

show asic-version

This command shows Switch-X Firmware version.

```
<BX900S2-CB3> [standalone: master] # show asic-version
```

```
=====
```

SX module	Version
=====	
SX	9.0.3052

show version

This command shows System Information.

```
<BX900S2-CB3> [standalone: master] # show version  
Product name:      SX_PPC_M460EX  
Product release:   SX_3.1.0936  
Build ID:          #1-dev  
Build date:        2011-10-02 15:06:46
```

```
Target arch:      ppc
Target hw:        m460ex
Built by:         alia@fit15

Uptime:           22m 20.100s

Product model:    ppc
Host ID:          0002C95EB028
System memory:    75 MB used / 1952 MB free / 2027 MB total
Swap:             0 MB used / 0 MB free / 0 MB total
Number of CPUs:   1
CPU load averages: 0.00 / 0.00 / 0.00
```

4.4 Users and Privileges

The CLI is entered via the Telnet/ssh interface of the management blade.

There are two user roles or account types: admin and monitor. As 'admin', the user is privileged to run all the available commands. As 'monitor', the user can run commands that show system configuration and status, or set terminal settings.

No	User name	Password	Authority level	Description
1	admin	admin	Adminis- trator	admin is privileged to run all the available commands.
2	monitor	monitor	user	monitor can run commands that show system configu- ration and status, or set terminal settings.

Table 5: Default user

4.5 CLI modes

The CLI can be in one of three modes, and each mode makes available a certain group (or level) of commands for execution. The three command modes are:

1. Standard mode

When the CLI is launched, it begins in Standard mode. This is the most restrictive mode and only has commands to query a restricted set of state information. Users cannot take any actions that directly affect the system, nor can they change any configuration.

2. Enable mode

The "enable" command moves the user to Enable mode. This mode offers commands to view all state information and take actions like rebooting the system, but it does not allow any configuration to be changed. Its commands are a superset of those in Standard mode. To return to Standard mode, enter "disable".

3. Config mode („admin“ only)

The "configure terminal" command moves the user from Enable mode to Config mode. Config mode is allowed only for user accounts in the "admin". This mode has a full unrestricted set of commands to view anything, take any action, or change any configuration. Its commands are a superset of those in Enable mode. To return to Enable mode, enter "exit" or "no configure". Note that moving directly from/to Standard mode to/from Config mode is not possible.

4.6 Starting MLNX-OS Web User Interface

This chapter describes how to log into the Web User Interface (WebUI) of Mellanox MLNX-OSSwitchX based managed switches.

4.6.1 Connecting to the Switch Platform

Please perform the following steps to start a WebUI connection to the switch platform:

Step1

Set up an Ethernet connection between the switch and a local network machine

Step2

Open a Web browse connection between the switch and a local network mac



Make sure the screen resolution is set to 1024*768 or higher.

Step3

Type in the IP address of the switch or its DNS name in the following format: `http://<switch_IP_address>`.

Step4

Enter your username and password to log in.

Step5

Click Login.

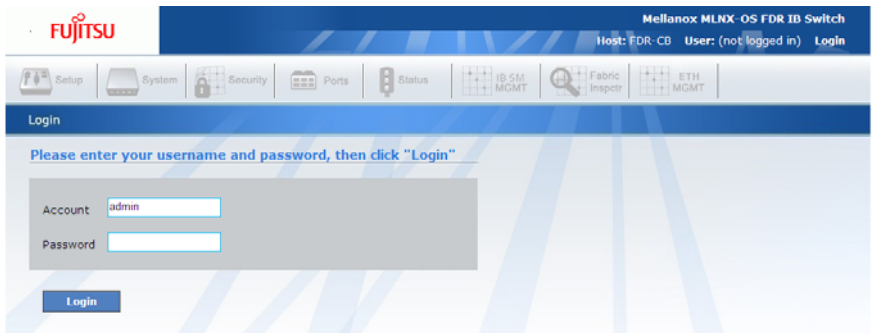


Figure 29: Login Mellanox MLNX-OS

There are two user roles or account types: *admin* and *monitor*. As *admin*, the user is privileged to execute all the available operations that are permitted by the installed license . As *monitor*, the user can execute operations that display system configuration and status, or set terminal settings.

User Role	Default Password
admin	admin
monitor	monitor

4.6.2 After Log-in Display

After you log in to MLNX-OS, a (default) status summary window will be displayed containing the following information:

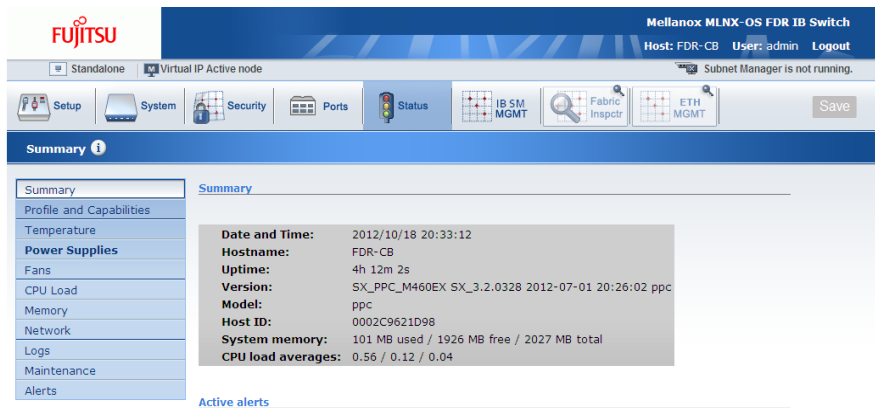

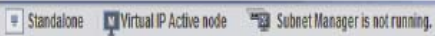


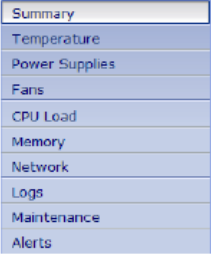
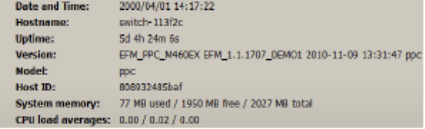



Figure 30: MLNX-OS status summary



Figure 31: Active alerts


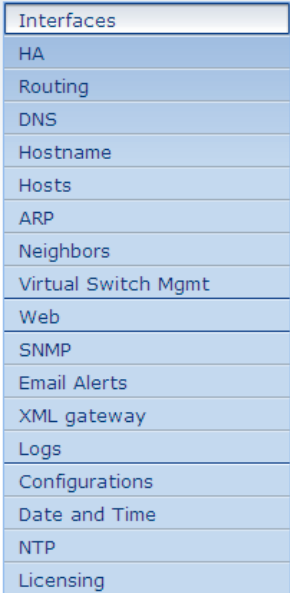
Icon	Description
	System Information Banner: Contains information on the switch system type.
	System Information Banner: Contains information on the: <ul style="list-style-type: none"> - OpenSM state - Chassis and SM HA role
	User credentials and Host name
	Action Pane: A display of the MLNX-OS menu icons
	Left Side Pane - Displays a list of the MLNX-OS submenus
	Information Summary - provides detailed information on the chosen menu
	A Save button used to save system's changes. A grayed out Save button suggests no system changes were performed, hence the button is disabled and cannot be clicked.

4.6.3 MLNX-OS WebUI

The WebUI of MLNX-OS makes available the following menus (listed in order of appearance from left to right):


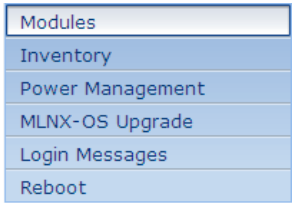
- SETUP
- SYSTEM
- SECURITY
- PORTS
- STATUS

4.6.4 SETUP MENU


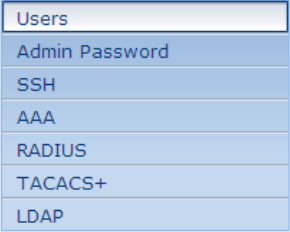
	<p>The Setup menu makes available the following sub-menus (listed in order of appearance from top to bottom).</p>
	<p>Interfaces is used to obtain the status of, configure, or disable interfaces to the InfiniBand fabric. Thus, you can: set or clear the IP address and netmask of an interface; enable DHCP to dynamically assign the IP address and netmask; and set interface attributes such as MTU, speed, duplex, etc.</p> <p>HA is used to create, join or modify an IB Subnet.</p> <p>Routing is used to set, remove or display the default gateway, and the static and dynamic routes of the fabric. DNS is used to set, remove, modify or display static and dynamic name servers.</p> <p>Hostname is used to set or modify the hostname.</p> <p>Hosts is used to set or delete static hosts.</p> <p>ARP is used to add static and dynamic ARP entries, and to clear the dynamic ARP cache.</p> <p>Virtual Switch Mgmt is used to set the system profile.</p> <p>Web is used to configure Web user interface and proxy settings.</p> <p>SNMP is used to configure SNMP attributes, SNMP admin user, and trap sinks.</p> <p>Email Alerts is used to define the destination of email alerts and the recipients to be notified.</p> <p>XML gateway provides an XML request-response protocol to get and set hardware management information.</p> <p>Logs is used to set up system log files, remote log sinks, and log formats.</p> <p>Configurations is used to manage, activate, save, and import MLNX-OS SwitchX configuration files, and to execute CLI commands.</p> <p>Date and Time is used to set the date, time, and time zone of the switch system.</p>

	NTP is used to set NTP (Network Time Protocol) and NTP servers.
	Licensing is used to manage MLNX-OS SwitchX licenses.


4.6.5 **SYSTEM MENU**

	<p>The System menu makes available the following sub-menus (listed in order of appearance from top to bottom)</p>
	<p>Modules displays a (photo) graphic illustration of the system modules (front and rear views). By moving the mouse over the ports in the front view, a pop-up caption is displayed to indicate the status of the port. The port state (active/down) is differentiated by a color scheme (green for active, gray/black for down). By moving the mouse over the rear view, a pop-up caption is displayed to indicate the leaf part information.</p>
	<p>Inventory displays a table with the following information about the system modules: module name, type, serial number, ordering part number and Asic firmware version.</p>
	<p>Power Management displays a table with the following information about the system power supplies: power supply name, power, voltage level, current consumption, and status (OK or NOT PRESENT). A total power summary table is also displayed providing the power [W] used, the power capacity, and the power available.</p>
	<p>MLNX-OS Upgrade is used to view the installed MLNX-OS images (and the active partition), to upload a new image, and to install a new image.</p>
	<p>Login Messages is used to edit the login messages: Message of the Day (MOTD), Remote Login message, and Local Login message.</p>
	<p>Reboot is used to reboot the system. Make sure that you save your configuration prior to clicking reboot. Rebooting the system may take several minutes.</p>


4.6.6 SECURITY MENU

	The Security menu makes available the following sub-menus (listed in order of appearance from top to bottom).
	Users is used to manage (setting up, removing, modifying) user accounts.
	Admin Password is used to modify the system administrator password.
	SSH is used to display and generate host keys.
	AAA is used to configure AAA (Authentication, Authorization, and Accounting) security services such as authentication methods and authorization.
	RADIUS is used to manage default RADIUS (Remote Authentication Dial In User Service) settings and RADIUS servers.
	TACACS+ is used to manage default TACACS+ (Terminal Access Controller Access-Control System Plus) settings and TACACS+ servers.
	LDAP is used to manage default LDAP (Light-weight Directory Access Protocol) settings and LDAP servers

4.6.7 PORTS MENU

	The PORTS menu displays port state and enables some configuration attributes of a selected port (by left-clicking on the desired port). It also enables the modification of the port configuration such as: port enabled/disabled, port speed, MTU size, and port VLs. A graphical display of traffic over time (last hour or last day) through the port is also available.
---	---

4.6.8 STATUS MENU

	<p>The Status menu makes available the following sub-menus (listed in order of appearance from top to bottom).</p>
<div data-bbox="180 411 468 778"> <ul style="list-style-type: none"> Summary Profile and Capabilities Temperature Power Supplies Fans CPU Load Memory Network Logs Maintenance Alerts </div>	<p>Summary displays general information about the switch system and the MLNX-OS SwitchX image, including: current date and time, hostname, uptime of system, installed MLNX-OS SwitchX image version, system memory, CPU load averages, etc.</p> <p>System Capabilities displays general information about the switch system capabilities such as the enabled profiles (e.g IB/ETH) and their corresponding values.</p> <p>Temperature provides a graphical display of the switch module sensors' temperature levels over time (1 hour). It is possible to display either the temperature level of one module's sensor or the temperature levels of all the module sensors' together.</p> <p>Power Supplies provides a graphical display of one of the switch's power supplies voltage level over time (1 hour). This function is not supported.</p> <p>Fans provides a graphical display of fan speeds over time (1 hour). The display is per fan unit within a fan module. This function is not supported.</p> <p>CPU Load provides a graphical display of the management CPU load over time (1 hour).</p> <p>Memory provides a graphical display of memory utilization over time (1 day).</p>

	Network provides a graphical display of network usage (transmitted and received packets) over time (1 day). It also provides per interface statistics.
	Logs displays the system log messages. It is possible to display either the currently saved system log or a continuous system log.
	Maintenance is used to perform specific maintenance operations automatically on a predefined schedule.
	Alerts is used to display a list of the recent health alerts and enables the user to configure health daemon settings

4.6.9 Installing the License

This function is not supported.

5 Troubleshooting

This chapter describes what to do if IB Mezzanine card and IB connection blade is not working properly.

If you cannot solve the problem, please contact the repair center:

<http://support.ts.fujitsu.com/com/support/index.html>

If you purchased the products from Fujitsu Japan, please consult your system engineer.

5.1 Check the Log File of OpenSM (Linux only)

Check the log file in the server (*/var/log/opensm.log*) that started up the Subnet Manager(OpenSM) as Master.

- ▶ Check list : Are any of the following logs contained in the */var/log/opensm.log*
 - SM port is down
 - Removed port with GUID:GUID number PRIx64 LID range [LID number, LID number] of node:
 - Reporting Generic Notice type:1 num:128 (Link state change) from LID:LID number GUID:GUID number

SM port is down

SubnetManager's master port was disconnected.

How to solve the problem: The following changes are required. Please contact the repair center.

1. IB Mezzanine card
You need to change the IB Mezzanine card that ran as the Master of the SubnetManager.
For the method of how to specify the exact IB Mezzanine card, please refer to [section "The result of the command "ibnetdiscover"" on page 35.](#)
2. ServerBlade
If you have changed IB Mezzanine card and you still see the same messages, you need to change the server blade that installed the IB Mezzanine card.

3. IB connection blade

If you have changed the above server blade and still get the same messages, you need to change IB connection blade. For details of how to specify the exact IB connection blade, please refer to [section “The result of the command “ibnetdiscover”” on page 35.](#)

Removed port with GUID:GUID number PRIx64 LID range [LID number, LID number] of node:

IB Mezzanine card, IB connection blade or IB cable was disconnected.

How to solve the problem: The following changes are required. Please contact the repair center.

1. IB Mezzanine card

You need to change the relevant IB Mezzanine card. You obtain the relevant IB Mezzanine card from GUID (or LID) information in the error messages and the output of *ibnetdiscover*.

For example:

```
Jul 30 23:34:18 600287 [4CD0D940] 0x02 ->
__osm_drop_mgr_remove_port: Removed port with
GUID:0x0002c90300041306 PRIx64 LID range [2, 2] of
node:localhost HCA-2
```

In this case, Error Card has the GUID 0x0002c90300041306 and the LID is 2 of Mezzanine Card).

2. IB connection blade

You need to change the relevant IB connection blade. You will get the relevant IB connection blade from GUID (or LID) information of the error messages and output of *ibnetdiscover*.

For example:

```
Jul 30 23:34:18 600424 [4CD0D940] 0x02 ->
__osm_drop_mgr_remove_port: Removed port with
GUID:0x0002c9020040c790 PRIx64 LID range [21, 21] of
node:(none) SW-1
```

In this case, Error IB connection blade has the GUID 0x0002c9020040c790 and the LID is 21.

For details of how to specify the relevant IB connection blade, refer to [section “The result of the command “ibnetdiscover”” on page 35.](#)

3. IB cable

If you have changed the above IB connection blade and you still receive the messages, all IB cables connected to the IB connection blade need to be changed.

Reporting Generic Notice type:1 num:128 (Link state change) from LID:LID number GUID:GUID number: the port of IB connection blade was disconnected in the subnet.

How to solve the problem: The following changes are required. Please contact the repair center.

1. IB cable

You need to change the IB cable. You specify the IB cables by the following procedure.

- You specify the relevant IB connection blade from the LID information in the error messages.

For example:

```
Jul 31 22:56:46 264171 [42E93940] 0x02 ->  
osm_report_notice: Reporting Generic Notice type:1 num:128  
(Link state change) from LID:32 GUID:fe80::2:c902:40:c790
```

In this case, LID 32's IB connection blade is corresponding.

For details of how to specify the relevant IB connection blade, refer to [section "The result of the command "ibnetdiscover" on page 35.](#)

- The target port is the one that removed the port number from original *ibnetdiscover* command output when the system was set up normally..

2. IB connection blade

If you have changed the above IB cable and still receive the same messages, you need to change the IB connection blade.

5.2 IB Mezzanine Card

You can confirm place and time the error occurred by referring to the following items on a server blade.

No.	Confirmation item
1	Active link LED for IB Mezzanine card on the front side of the blade
2	IB Mezzanine card driver message

Active link LED for IB Mezzanine card

When an active link LED for IB Mezzanine card on the front side of the server blade goes dark, you can confirm the place where the error occurred using the following confirmation contents.

No.	Confirmation item	Judgment	To do
1	Is the server blade turned on?	YES	Go to No.2
		NO	Turn on the server blade.
2	Are the LEDs of all server blades turned off?	YES	Confirm OpenSM running on the MASTER OpenSM server.
		NO	Go to No.3
3	Is the LED of one server blade in the system turned off?	YES	Go to No.4
		NO	Go to No.5
4	Is the IB Mezzanine card mounted rigidly?	YES	<p>1. Replace the IB Mezzanine card.</p> <p>2. If the LED is still turned off after replacing the IB Mezzanine card, replace the server blade.</p> <p>3. If the LED is still turned off after replacing the server blade, replace the IB connection blade.</p> <p>4. If the LED is still turned off, please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
		NO	Mount the IB Mezzanine card more rigidly.
5	Does IB connection blade work normally? Please refer to section “IB Connection Blade” on page 76.	YES	Go to No.4
		NO	<p>Replace the IB connection blade. Please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>

Table 6: Indication lamps

IB Mezzanine card driver messages (Linux)

Confirm the error message of IB Mezzanine card driver by referring to the `/var/log/messages` log file. You refer to the log file using the text editor etc.

No.	Classification	To do
1	Installed FW has unsupported command interface revision %d. (Installed FW version is %d.%d.%03d) This driver version supports only revisions %d to %d.	The IB Mezzanine card must be replaced. Please consult technical.support@ts.fujitsu.com If you purchased the products from Fujitsu Japan, please consult the system engineer.
2	This driver version supports only revisions %d to %d.	
3	Internal error detected: buf[%02x]: %08x	
4	Failed to initialize user access region table, aborting.	
5	Couldn't map EQ doorbell for EQN 0x%06x	(note1)
6	Couldn't map interrupt clear register, aborting.	
7	Couldn't allocate FW area, aborting.	
8	Failed to map MCG context memory, aborting.	

Table 7: Error messages of IB Mezzanine card driver (Red Hat Enterprise Linux)

No.	Classification	To do
9	Failed to allocate driver access region, aborting.	<p>The IB Mezzanine card must be replaced. Please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
10	Failed to initialize memory region table, aborting.	
11	Failed to initialize event queue table, aborting.	
12	Failed to switch to event-driven firmware commands, aborting.	
13	NOP command failed to generate interrupt (IRQ %d), aborting.	
14	Failed to initialize completion queue table, aborting.	
15	Failed to initialize shared receive queue table, aborting.	
16	Failed to initialize queue pair table, aborting.	
17	Failed to initialize multicast group table, aborting.	
18	Failed to reset Mezzanine card, aborting.	
19	Failed to init command interface, aborting.	
20	Only %d UAR pages (need more than 128)	(note1)
21	Profile requires 0x%llx bytes; won't fit in 0x%llx bytes of context memory.	(note1)

Table 7: Error messages of IB Mezzanine card driver (Red Hat Enterprise Linux)

No.	Classification	To do
22	Couldn't allocate memory to save Mezzanine card PCI header, aborting.	<p>The IB Mezzanine card must be replaced. Please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
23	Couldn't save Mezzanine card PCI header, aborting.	
24	Couldn't map Mezzanine card reset register, aborting.	
25	PCI device did not come back after reset, aborting.	
26	Couldn't restore Mezzanine card PCI Express Device Control register, aborting.	
27	Couldn't restore Mezzanine card PCI Express Link control register, aborting.	
28	Couldn't restore Mezzanine card reg %x, aborting.	
29	Couldn't restore Mezzanine card COMMAND, aborting.	

Table 7: Error messages of IB Mezzanine card driver (Red Hat Enterprise Linux)

note1: When a message occurs frequently, confirm the following:

No.	Confirmation contents	Judgment	To do
1	Is the IB Mezzanine card mounted rigidly?	YES	The IB Mezzanine card must be replaced. When the message is displayed after the IB Mezzanine cards are exchanged, it is necessary to replace the server blade.
		NO	Place the IB Mezzanine card again.

Work after IB Mezzanine card has been replaced (Linux)

1. The server blade is mounted on the main body of BX900 and the power supply is turned on.
2. Linux is started, `/sbin/lspci` command is executed by the root account, and it is confirmed that the IB Mezzanine card is recognized.

Execution result:

```
10:00.0 InfiniBand: Mellanox Technologies MT27500 Family [ConnectX-3]
Subsystem: Mellanox Technologies MT27500 Family [ConnectX-3]
30:00.0 InfiniBand: Mellanox Technologies MT27500 Family [ConnectX-3]
Subsystem: Mellanox Technologies MT27500 Family [ConnectX-3]
```

The enhancing board slot where this card is mounted can be confirmed by the value of Bus#.

10:00.0 -- Enhancing board slot 1

30:00.0 -- Enhancing board slot 2

3. Refer to [section “Configuration sheet” on page 30](#), update a GUID table.

IB Mezzanine card driver messages (Windows Server 2008 R2 SP1)

Confirm the message of the IB Mezzanine card driver by referring to the event log. You refer to the event log using the Event Viewer.

Event ID Error Level	Classification	To do
0x0041 Error	xxx: Failed to open Channel Adapter.	<p>The IB Mezzanine card must be replaced.</p> <p>Please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
0x0042 Error	xxx: Failed to allocate Protection Domain.	
0x0043 Error	xxx: Failed to create receive Completion Queue.	
0x0044 Error	xxx: Failed to create send Completion Queue.	
0x0045 Error	xxx: Failed to create Queue Pair.	
0x0046 Error	xxx: Failed to get Queue Pair number.	
0x0047 Error	xxx: Failed to create DMA Memory Region.	
0x0048 Error	xxx: Failed to create receive descriptor pool.	
0x0049 Error	xxx: Failed to create NDIS_PACKET pool to receive indications.	
0x004A Error	xxx: Failed to create NDIS_BUFFER pool to receive indications.	
0x004B Error	xxx: Failed to create NDIS_PACKET pool to send processing.	
0x004C Error	xxx: Failed to create NDIS_BUFFER pool to send processing.	

Table 8: [source:ipoib]

Event ID Error Level	Classification	To do
0x004D Error	xxx: Failed to allocate receive indication array.	<p>The IB Mezzanine card must be replaced.</p> <p>Please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
0x004E Error	xxx: Subnet Administrator query for port information timed out. Make sure the SA is functioning properly. Increasing the number of retries and retry timeout adapter parameters may solve the problem.	
0x004F Error	xxx: Subnet Administrator failed the query for port information. Make sure the SA is functioning properly and compatible.	
0x0050 Error	xxx: Subnet Administrator query for port information failed.	
0x0055 Error	xxx: Subnet Administrator failed query for broadcast group information.	
0x0056 Error	xxx: Subnet Administrator failed request to joining broadcast group.	
0x0057 Error	xxx: The local port rate is too slow for the existing broadcast MC group.	
0x0058 Error	xxx: Incorrect value or non-existing registry for the required IPoIB parameter %3, overriding it by default value: %4	

Table 8: [source:ipoib]

Event ID Error Level	Classification	To do
0x005B Error	xxx: Pkey index not found for partition, change switch pkey configuration.	<p>The IB Mezzanine card must be replaced.</p> <p>Please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
0x005C Error	xxx: Connected Mode failed to initialize, disabled. Interface will use default UD QP transport.	
0x005E Error	xxx: SetDeviceRegistrationAttributes failed.	
0x005F Error	xxx: SetAdapterRegistrationAttributes failed.	
0x0060 Error	xxx: SetOffloadAttributes failed.	
0x0061 Error	xxx: ipoib_create_adapter failed.	
0x0062 Error	xxx : ipoib_start_adapter failed.	

Table 8: [source:ipoib]

Event ID Error Level	Classification	To do
0x0003 Error	The message changes in each event.	<p>The IB Mezzanine card must be replaced. Please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
0x0004 Error	mlx4_bus has started in non-operational mode.	
0x0005 Error	mlx4_bus has failed to start even in non-operational mode.%n Look into the the previous error messages.	
0x0007 Error	MAP_FA command failed with error %2.%n The adapter card is non-functional.%n Most likely a FW problem.%n Please burn the last FW and restart the mlx4_bus driver.	
0x0008 Error	RUN_FW command failed with error %2.%n The adapter card is non-functional.%n Most likely a FW problem.%n Please burn the last FW and restart the mlx4_bus driver.	
0x0009 Error	QUERY_FW command failed with error %2.%n The adapter card is non-functional.%n Most likely a FW problem.%n Please burn the last FW and restart the mlx4_bus driver.	

Table 9: [source: mlx4_bus]

Event ID Error Level	Classification	To do
0x000B Error	<p>QUERY_DEV_CAP command failed with error %2.%n</p> <p>The adapter card is non- functional.%n</p> <p>Most likely a FW problem.%n</p> <p>Please burn the last FW and restart the mlx4_bus driver.</p>	<p>The IB Mezzanine card must be replaced. Please consult technical.support@ts.fujitsu.com</p> <p>If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
0x000C Error	<p>QUERY_ADAPTER command failed with error %2.%n</p> <p>The adapter card is non- functional.%n</p> <p>Most likely a FW problem.%n</p> <p>Please burn the last FW and restart the mlx4_bus driver.</p>	
0x000D Error	<p>Too few QPs were requested (requested %2, reserved for FW %3).%n</p> <p>The adapter card is non- functional.%n</p> <p>Please increase the Registry LogNumQp parameter under HKLM\System\CurrentCon- trolSet\Services\mlx4_bus\ Parameters.</p>	
0x0011 Error	Failed to move location string '%2', status %3.	
0x0012 Error	WdfDeviceAllocAndQue- ryProperty failed, status %2.	

Table 9: [source: mlx4_bus]

Event ID Error Level	Classifi- cation	To do
0x0003 Error	The message changes in each event.	The IB Mezzanine card must be replaced. Please consult technical.support@ts.fujitsu.com If you purchased the products from Fujitsu Japan, please consult the system engineer.

Table 10: [source:ibbus]

Work after IB Mezzanine card has been exchanged (Windows Server 2008 R2 SP1)

1. Turn on the server.
2. Make sure that the InfiniBand devices are recognized properly in Device Manager.

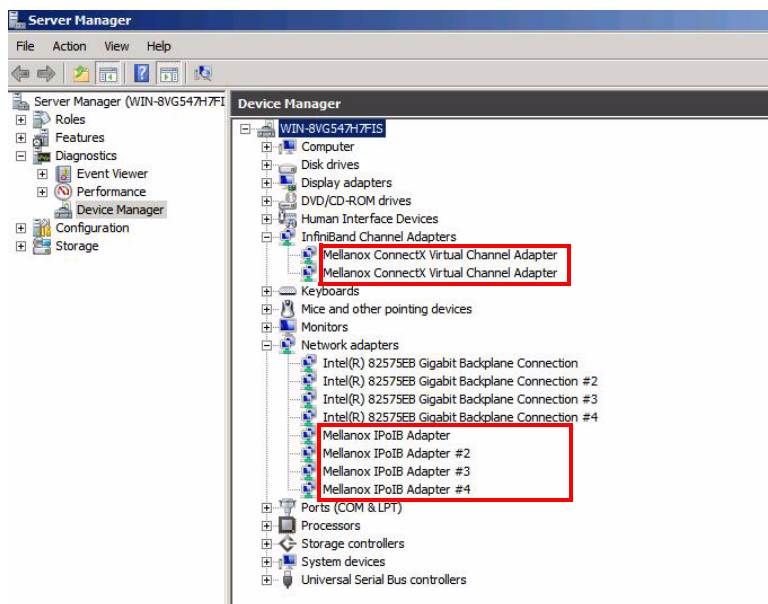


Figure 29: Device manager

3. Refer to [section “Configuration sheet” on page 30](#), update a GUID table.

5.3 IB Connection Blade

IB Connection Blade Message

Connect to IB connection blade via MMB (Console Redirection). The reference to the `/var/log/messages` log file uses the text editor etc.

No.	Classification	To do
1	Installed FW has unsupported command interface revision %d. (Installed FW version is %d.%d.%03d) This driver version supports only revisions %d to %d.	The IB connection blade must be replaced. Please consult technical.support@ts.fujitsu.com If you purchased the products from Fujitsu Japan, please consult the system engineer.
2	This driver version supports only revisions %d to %d.	
3	Internal error detected: buf[%02x]: %08x	

Table 11: IB connection blade messages

SNMP Trap messages

When SNMP Trap of the IB connection blade is set to *enable*, following snmp trap is transmitted to SNMP Manager.

No.	SNMP Trap	OID	Content and Action
1	asicOverTemp	1.3.6.1.4.1.33049.2.2.2.3	[Content] The temperature of asic is too high. [Action] Confirm that ambient temperature of BX900 or BX400 system does not have abnormality. When ambient temperature does not have abnormality, the IB connection blade must be replaced. Please consult technical.support@ts.fujitsu.com If you purchased the products from Fujitsu Japan, please consult the system engineer.

Table 12: snmp trap

No.	SNMP Trap	OID	Content and Action
2	lowPower	1.3.6.1.4.1.33049.2.2.2.4	<p>[Content] The MLNX-OS management appliance has a low power budget.</p> <p>[Action] Confirm that PSU or Power Supply source of BX900 or BX400 system does not have abnormality. Please consult technical.support@ts.fujitsu.com If you purchased the products from Fujitsu Japan, please consult the system engineer.</p>
3	lowPower Recover	1.3.6.1.4.1.33049.2.1.2.8	<p>[Content] The MLNX-OS management appliance has been restored to its normal power.</p> <p>[Action] lowPowerRecover indicates a recovery from low power situation.</p>

Table 12: snmp trap

Work after the exchange

1. IB connection blade is mounted on the main body of BX900/BX400 and the power supply is turned on.
2. Confirm that the Status LED of the IB connection blade lights to green. It takes about 90 seconds till the CPU of the IB connection blade starts.
3. Connect to the console of the IB connection blade via *ssh* and wait for the prompt of the IB connection blade to be displayed. When no prompt is displayed, push *Enter* and confirm that a prompt is displayed.
4. Change to config mode.

Example:

```
BX900S2-CB3 [standalone: master] > enable
BX900S2-CB3 [standalone: master] # configure terminal
```

5. Set ip address and netmask which there was it before exchange.

Example:

```
BX900S2-CB3 [standalone: master] (config) # interface mgmt0
ip address 192.168.1.10 255.255.255.0
```

6. Restore composition definition information. Please refer to [section “Save and restore the configuration” on page 56](#).
7. Connect IB-Cable to the same port as before.
8. Confirm that LED of P and L/A lights. It might take about one minute to lighting LED.
9. Execute *show interface ib0* command from the console of the IB connection blade, and confirm that Link up: yes

Example:

```
BX900S2-CB3 [standalone: master] (config) # show interfaces
ib0 Interface ib0 state
```

```
Admin up:          yes
Link up:           no
IP address:
Netmask:
IPv6 enabled:      yes
Autoconf enabled:  no
Autoconf route:    yes
Autoconf privacy:  no
Speed:             10 Gb/sec (1X QDR)
Duplex:            full
Interface type:     ib
Interface ifindex:  4
Interface source:   physical
MTU:               2044
HW address:
00:00:00:02:00:00:00:00:00:00:00:02:c9:03:00:5d:0c:a0
Comment:
```

RX bytes:	0	TX bytes:	0
RX packets:	0	TX packets:	0
RX mcast packets:	0	TX discards:	0
RX discards:	0	TX errors:	0
RX errors:	0	TX overruns:	0
RX overruns:	0	TX carrier:	0
RX frame:	0	TX collisions:	0
		TX queue len:	256

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